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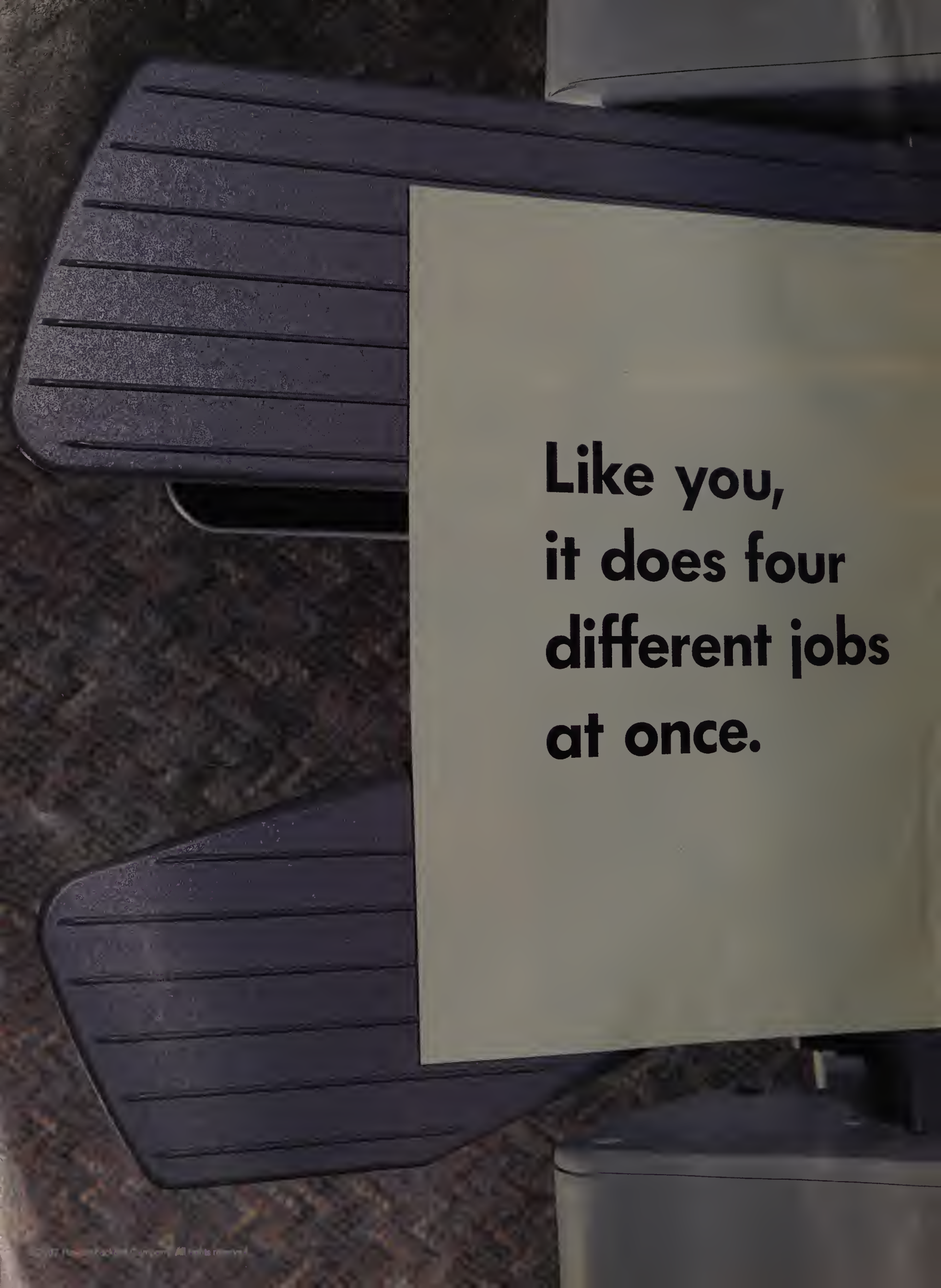
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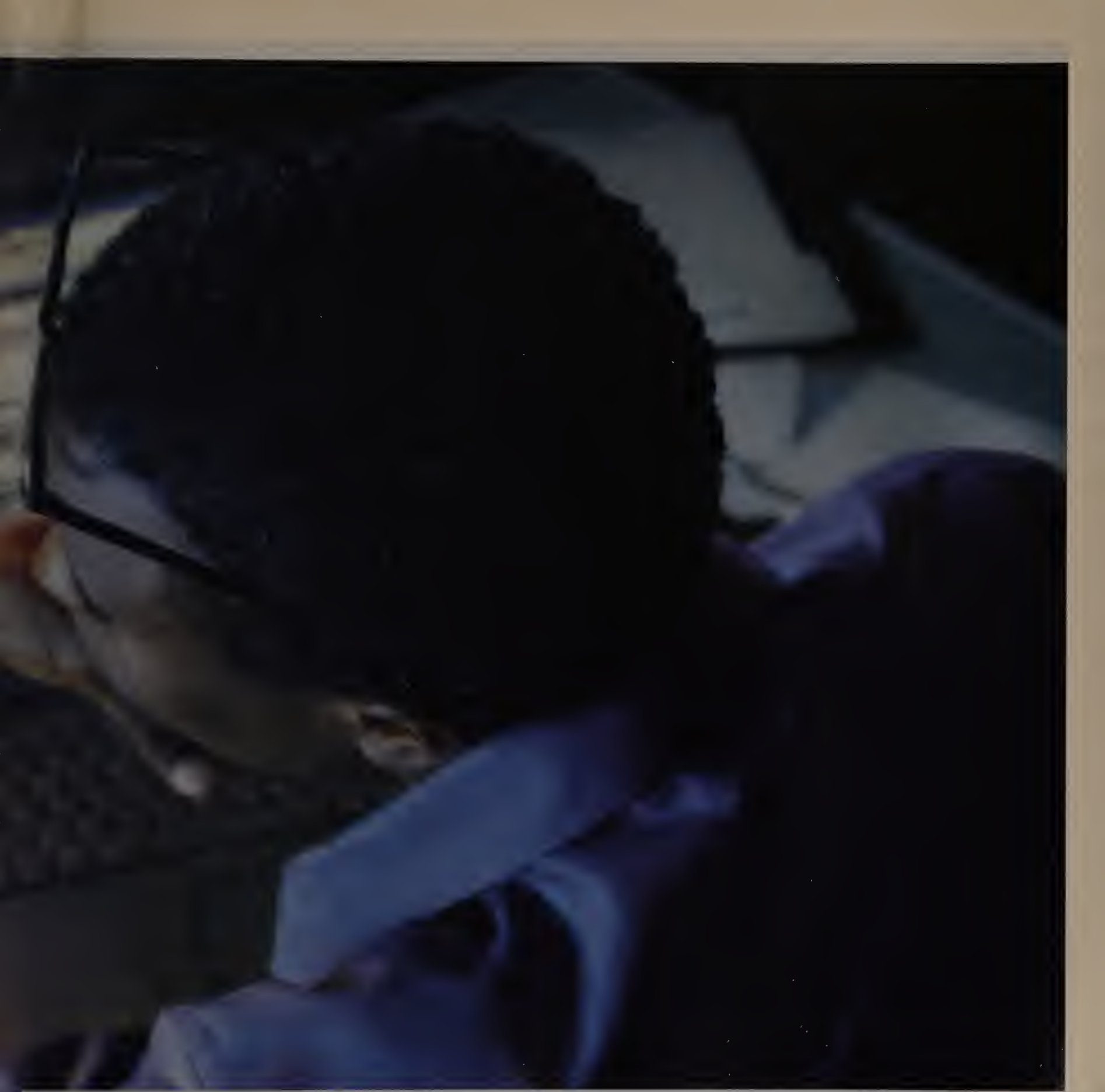
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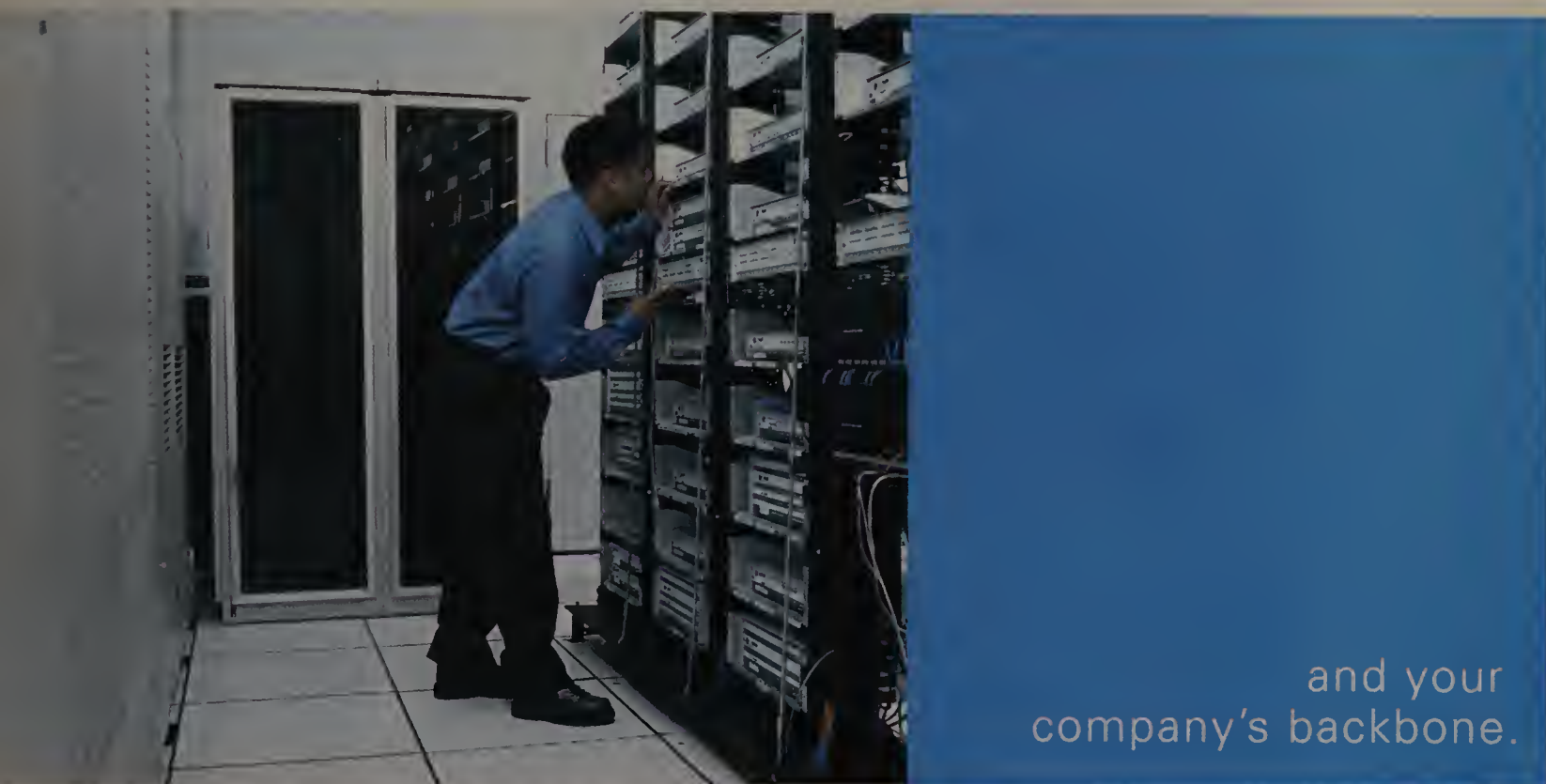
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## COVER STORY

### 92 Protect Your PC

Virus writers, hackers, spammers, and marketers—nefarious forces seem to be intent on invading your PC every day. How can you fend them off and keep your system out of their clutches? We evaluated a variety of antivirus scanners, firewalls, ad and stealthware blockers, and junk-mail screeners. With the help of our Best Buy selections, you can fortify your computer and keep it safe.

Cover Photography by Marc Simon



# PC WORLD

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Heavenly hardware, spectacular software, inspired Internet sites and tools—members of *PC World's* expert editorial staff pool their collective wisdom to identify the best products of the past year. The envelope, please. We also revisit World Class honorees through the years and name the top five World Class Award winners of all time.



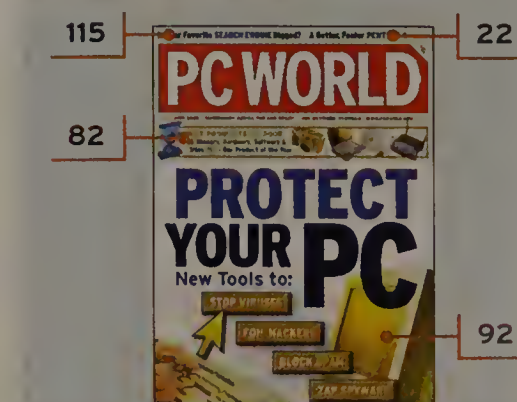
### SEARCH ENGINES

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Nikon's spunky, sub-\$500 Coolpix 2500 captures a Best Buy.  
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**Outstanding Sites:** We pick the best places to go on the Web and try out a few online services to see if they're worth paying for.

**Spam I Am:** Ever wonder what's behind a junk e-mail operation? We go undercover to get the inside story on spammers and find

effective ways to combat them.

**Scads of Scanners:** New models have the speed, color depth, and resolutions you need. We scan the offerings and find two Best Buys.

**Best Backups:** Keep your data safe. Here are the top drives for backing up important files.

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- 166 **Answer Line**  
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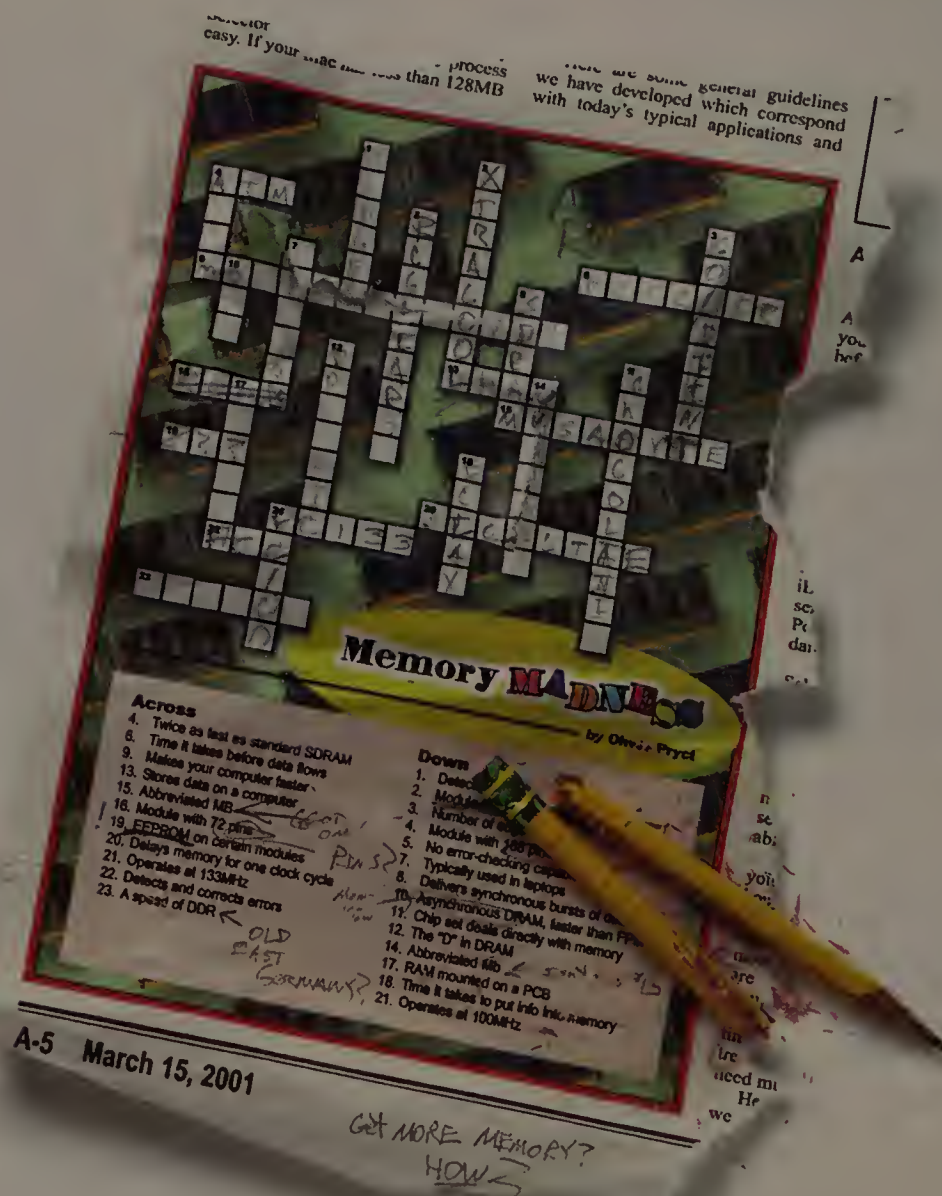
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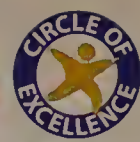
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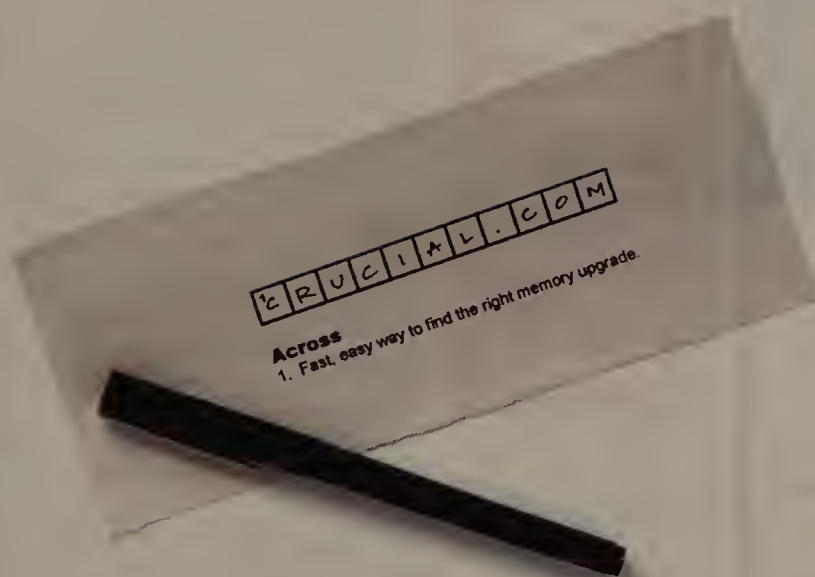
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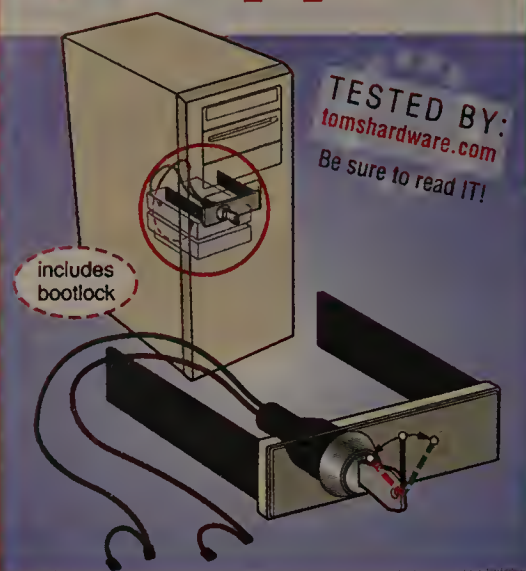
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- Host dual languages
- Upgrading your computer (choose which operating system to boot up with)
- Use mirror disks (up 'n running in no time).

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It's a swapper, which, depending on your operating system, permits you to choose when installing it whether or not to grant access to the other hard drive regardless of chosen boot drive. Example: boot from C drive and allow access to D as well. Or, choose to boot from D and automatically deny access to C.

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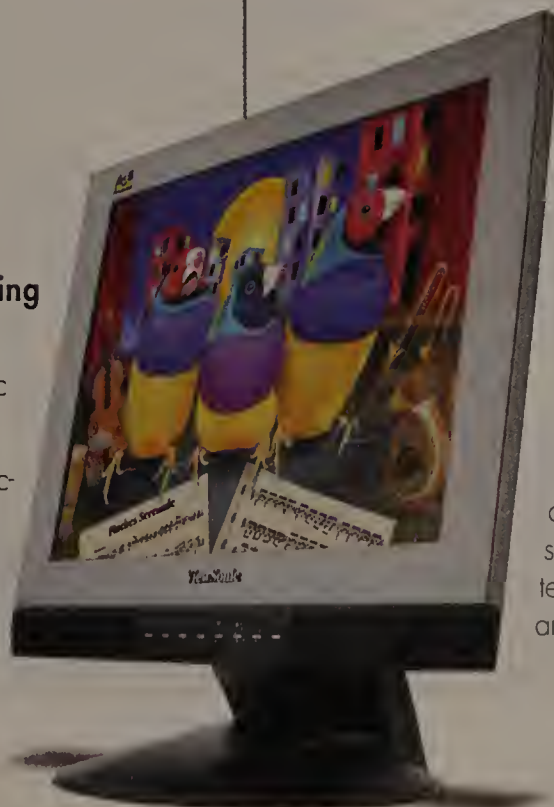
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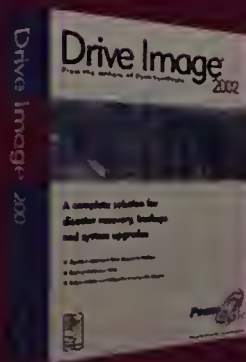
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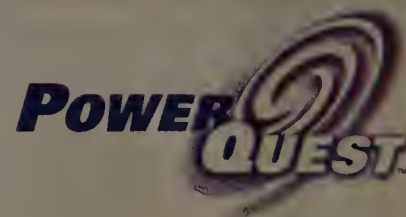
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PROVEN SOLUTIONS FOR STORAGE MANAGEMENT



## Who Really Controls Your PC?

Increasingly, a phantom army of marketers, hackers, and virus writers does.

A COUPLE OF US WERE VISITING a partner company the other day, watching a demo in the conference room. Our partners were trying to show us pages on their development Web server. Often what they got instead were pop-up ads that had no relation to their site.

This was especially surprising because a development server—where Web designers troubleshoot new pages—should not have live advertising. The culprit, as you've probably guessed, was an ad-serving program that had sneaked onto our partners' PC during a recent download, probably when someone clicked 'Install' or 'OK' without reading the fine print. Ever since, the program has periodically tossed up random ads.

This was only a mild annoyance, but it exemplifies a serious and growing threat. In the early days of personal computing, nothing made its way onto your PC unless you or the manufacturer put it there. You had control of your PC.

That's no longer the case. Even if you're vigilant about deterring intruders, as most *PC World* readers are, your computer is under constant attack from parties who want to divert it to suit their own agenda.

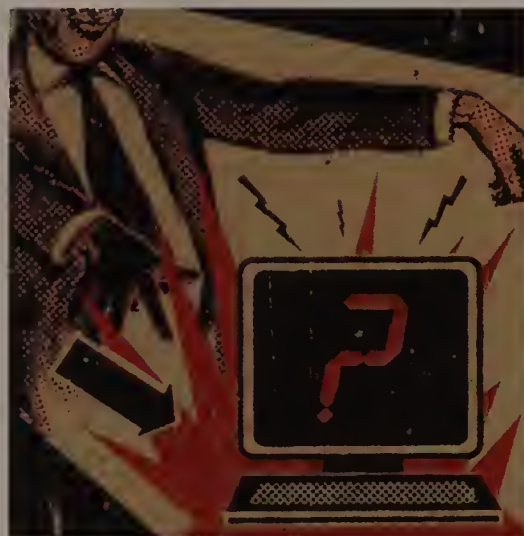
### MARKETING ONSLAUGHT

MARKETERS ARE the most obvious intruders, and the aggressive methods that some of them use bother many people. After Editor Harry McCracken wrote in this column two months ago about his concern over intrusive ads on *PC World's* own Web site, we received an outpouring of agreement from readers (for a sample, see *Letters* on page 39).

Marketers know that their tactics can be annoying, of course, but the temptation to use ads such as pop-ups and pop-under is powerful. Witness the success of X10's

camera ads: In some recent months this pitch was seen by one in three Internet users, according to Media Metrix.

Spam is another (relatively) harmless intruder that many of us find irritating.



Viruses, on the other hand, can do serious and irremediable damage. And anyone who runs a firewall is familiar with the many pings that even small systems get daily; most are benign, but some are from hackers seeking a way in.

The popularity of free downloads and file swapping introduces another potential source of intrusions. The file-sharing site Kazaa took heat in April after reports that 20 million copies of its downloaded client software contained technology

that could take over a PC's processor and storage space for a planned distributed-computing network called Altnet. Kevin Bermeister, president and CEO of Brilliant Digital Entertainment of Los Angeles, which created the technology, disputes that. He says the code is there only to enable sponsored search results on Kazaa, much like those on Yahoo and Google. To join Altnet, Bermeister adds, you will have to download an additional component that lets you choose how much of your PC's power you want to share—and that won't be offered until "July or later." Nevertheless, the incident underscores the potential for misunderstanding or even abuse.

To regain control of your PC, you need the tools Robert Luhn and Scott Spanbauer review in "Protect Your PC" on page 92. You'll learn about utilities to stop spam and detect freeloading "spyware"—programs that slip into your PC and track what you do. You'll also find reviews of the top antivirus packages and firewalls. "These products make similar claims, but only rigorous testing can identify the most effective," says Associate Editor Seán Captain, who helped edit the story. Throw in our May feature on ad-blockers ("It's an Ad, Ad, Ad, Ad World," find [pcworld.com/28682](http://pcworld.com/28682)), and you'll have a safer system. But stay tuned: The battle for control of your PC is just starting. ■

Kevin McKean ([kevin\\_mckean@pcworld.com](mailto:kevin_mckean@pcworld.com)) is editorial director of *PC World*.

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# NEWS & TRENDS

EDITED BY RAMON G. McLEOD

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## P4 BESTS ATHLON

PRICEY INTEL-BASED PC EDGES PAST AMD.

BY LAURIANNE McLAUGHLIN

### TEST Center

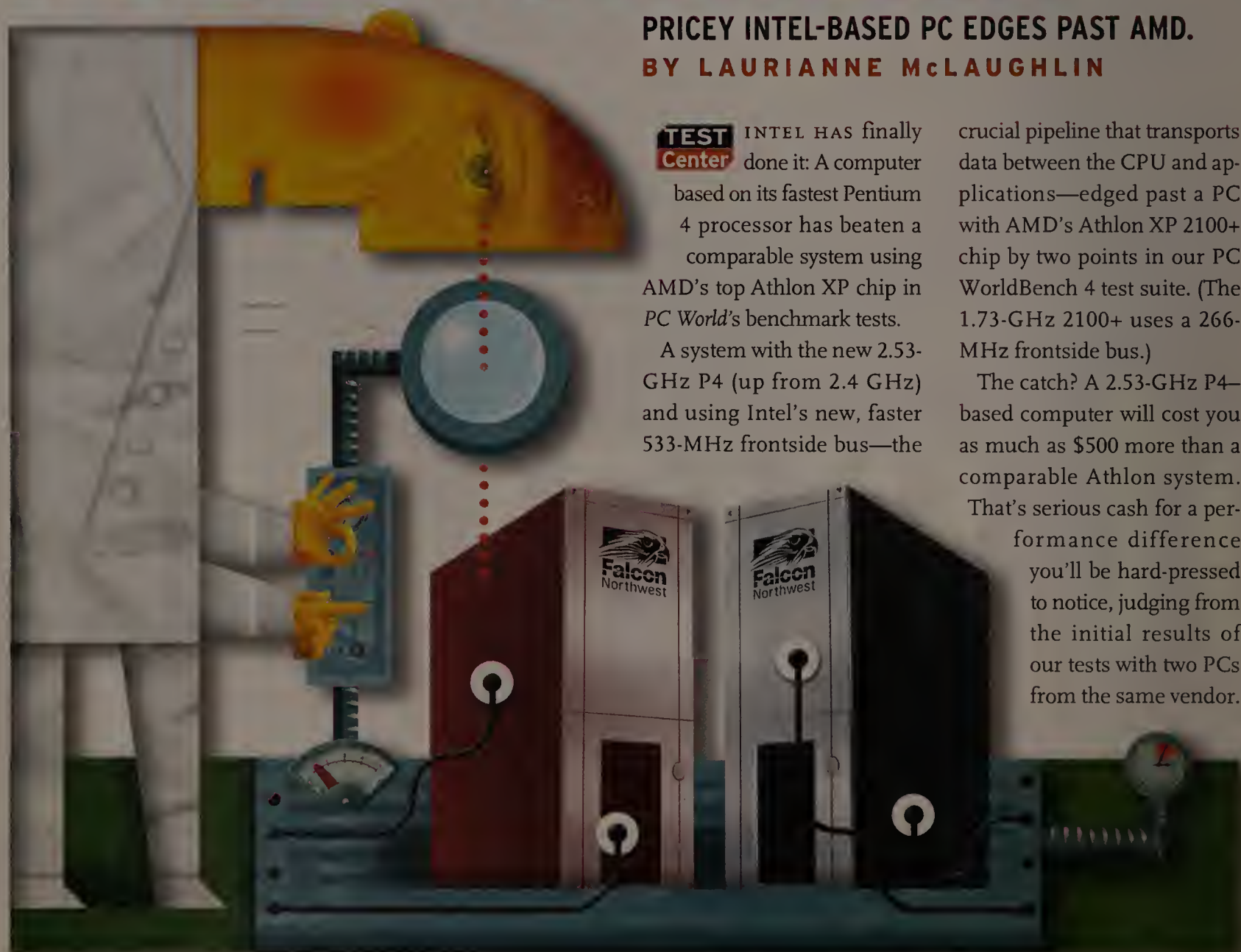
INTEL HAS finally done it: A computer based on its fastest Pentium 4 processor has beaten a comparable system using AMD's top Athlon XP chip in *PC World's* benchmark tests.

A system with the new 2.53-GHz P4 (up from 2.4 GHz) and using Intel's new, faster 533-MHz frontside bus—the

crucial pipeline that transports data between the CPU and applications—edged past a PC with AMD's Athlon XP 2100+ chip by two points in our *PC WorldBench 4* test suite. (The 1.73-GHz 2100+ uses a 266-MHz frontside bus.)

The catch? A 2.53-GHz P4-based computer will cost you as much as \$500 more than a comparable Athlon system.

That's serious cash for a performance difference you'll be hard-pressed to notice, judging from the initial results of our tests with two PCs from the same vendor.



Intel's latest rollout pushes P4 PCs past Athlon XP systems, but AMD isn't standing still. It will soon introduce an Athlon XP processor using a .13-micron manufacturing process that it says delivers better speed and performance than chips made with the older .18-micron process can achieve.

Still, Intel-only buyers will

want the new combination because it does offer a slight performance boost. In fact, even prospective buyers looking at a 2.4-GHz PC should seek one that has the new bus (labeled the 2.4B), because Intel is not charging extra for it. (The 2.26-GHz P4 also has the bus.)

Do pick a 533-MHz-ready chip, but don't expect big per-

formance gains. We saw only one application spike with the new bus. As Intel speeds up the P4 and adds support for faster memory, however, the 2.4B bus could play a larger performance role.

To support the faster bus, Intel has revamped its system chip sets, introducing higher-quality integrated graphics ►

## FAST BUS, SAME FARE

SYSTEM CHIP SETS—the unglamorous supporting characters on a motherboard that keep a PC's show running—continue to be a key part of an informed buying decision, and in some ways Intel's newest chip sets differ significantly from their predecessors. Among four new chip-set options, you'll find some with built-in support for USB 2.0 and others with Intel's latest integrated graphics.

The new 850E chip set (replacing the 850) ships only on P4 systems with PC 800 RDRAM memory. This chip set supports both the new 533-MHz frontside bus and the older 400-MHz bus, but doesn't bundle USB 2.0 support or integrated graphics. Since RDRAM ships in only the most expensive of today's high-end systems, few buyers would want integrated graphics anyway. However, the lack of integrated USB 2.0—the new standard that over-optimistically promises speeds of up to 480

mbps compared with 12 mbps on the older USB 1.1 standard (see "USB 2.0's Real Deal," April, [find.pcworld.com/28661](http://find.pcworld.com/28661))—means that vendors must spend a little more to add this feature separately.

Intel's 845E and 845G chip sets (replacing today's 845) are the ones you'll see in most mainstream PCs. These work with DDR memory (alternatively, vendors can choose PC-133 SDRAM for the 845G) and include support for USB 2.0. Both also support the P4's 400- and 533-MHz bus.

### BETTER GRAPHICS

THE 845G CHIP set differentiates itself by offering Intel's latest integrated graphics technology, which saves the PC maker the cost of a separate

graphics card—a savings they generally pass along to buyers. But because this chip set also supports a separate AGP 4X graphics card, a PC vendor—or buyer—can add such a card later.

Intel compares the graphics power of the 845G chip set to that of an older, mainstream graphics processor, the GeForce2 MX200. Although the gaming and graphics crowds have moved to more sophisticated and expensive graphics cards based on chips such as the GeForce3 and GeForce4, Intel is betting that the 845G will deliver enough

graphics power to satisfy cost-conscious middle-of-the-road PC buyers.

The 845G systems use what Intel calls Dynamic Video Memory Technology. In previous integrated-graphics systems, the Intel processor claimed a chunk of the system's main memory for graphics use. In the new scheme, software applications and Intel's

graphics driver software can have on-the-fly conversations with the operating system to discuss how much system memory should be dedicated—up to 48MB—for a graphics processing chore.

The final new chip set, the 845GL, appears in Celeron systems only. It has the same integrated graphics technology as the 845G, but with no graphics card upgrade path.

Most PC vendors will phase out the older chip sets in favor of the new ones relatively quickly, but if you want to ensure that you get the latest technology, check before you buy.

Also, Intel isn't charging anything extra for the new chip sets, so don't let a PC vendor charge you a premium for a PC that uses one.

AN INTEL motherboard sporting the 845G chip set.



## Tidbytes

**REPLAYTV RUCKUS:** Sonicblue is requesting a review of a magistrate's ruling requiring the company to collect and turn over data about how owners of Sonicblue's ReplayTV 4000 series use the digital video recorders. A judge issued the order at the request of AOL Time Warner, Disney, NBC, Viacom, and other Hollywood giants that have sued Sonicblue alleging that the recorders enable



theft of copyrighted programming. The entertainment companies are particularly concerned about a feature in the recorder that lets users send recorded shows to other ReplayTV 4000 units over the Internet. (The device wins a World Class Award for Best Gadget—see page 88.)

**GOOD-BYE, JORNADA:** Following its merger with Compaq, Hewlett-Packard plans to continue marketing the notebook and desktop PC lines of both companies—for now. But HP's Jornada handheld line will bow out in favor of Compaq's higher-profile IPaq brand. HP will phase out its Vectra PCs and its Omnibook notebooks as well, but HP's corporate E-PCs will endure alongside Compaq's Evo line. Visitors to Compaq's old Web site are being redirected to HP's home page, which touts the merger in a redesign featuring the slogan "HP & Compaq: The new power of invention."

# NEW 1.7-GHz CELERON: A BAD BUY

IN ITS LATEST MOVE to woo budget PC buyers, Intel has ratcheted up the clock speed of its Celeron processor from 1.3 GHz to 1.7 GHz and pumped up the frontside bus speed from 100 MHz to 400 MHz. But based on *PC World's* exclusive tests of a PC using the new Celeron, you should avoid it: This chip is all bark and no bite.

The new Celeron uses the same core as older Pentium 4 chips. But Intel decided to ship this processor with a scant 128KB Level 2 cache, half the size of the L2 cache of previous Celeron and older P4 chips (newer P4s have a 512KB L2 cache).

The 128KB L2 cache evidently hindered the speed of the preproduction 1.7-GHz Celeron system we tested, an \$849 Gateway 300S: It managed a meager score of 83 on our PC WorldBench 4 tests. A comparable 1.7-GHz Pentium 4 system—with the same integrated graphics—ran more than 12 percent faster, earning a score of 93.

The CD-RW drive, monitor, and speakers on our \$1253 P4 test system, a preproduction Gateway 500, were better than those on the 300S. But while configured just like the 300S except for the CPU, the 500 sells for \$1028—only \$179 more.

In addition, the 1.7-GHz Celeron system actually performed worse than older Celeron machines that *PC World* has tested: A comparable 1.3-GHz Celeron system from Dell earned a score of 92, and similar 1.2-GHz Celeron PCs from Gateway and HP logged scores of 89 and 90, respectively.

## IT SOUNDS FAST

INTEL DECIDED to go with the 128KB cache size in order to deliver the 1.7-GHz Celeron at a desired price point, says spokesperson George Alfis.

## TEST REPORT

## P4 VERSUS CELERON

| SYSTEM       | Processor         | PC WorldBench 4<br>Faster | Musicmatch<br>Jukebox 7<br>(seconds) | Lighting<br>effects<br>(seconds) | Multiple<br>filters<br>(seconds) | AutoCAD<br>(seconds) | Adobe Photoshop 6.0.1<br>Audio file<br>conversion<br>(seconds) | Windows Media Encoder 7.1<br>Video file<br>conversion<br>(seconds) | Unreal<br>Tournament<br>4.36<br>(frames per<br>second) |
|--------------|-------------------|---------------------------|--------------------------------------|----------------------------------|----------------------------------|----------------------|----------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------|
| Gateway 500  | 1.7-GHz Pentium 4 | 93                        | 26                                   | 78                               | 102                              | 436                  | 77                                                             | 77                                                                 | 25                                                     |
| Gateway 300S | 1.7-GHz Celeron   | 83                        | 30                                   | 108                              | 129                              | 717                  | 86                                                             | 86                                                                 | 22                                                     |



**HOW WE TEST:** Both systems ran the Windows XP Professional operating system, included 256MB of system memory, and used integrated graphics. For additional information on the tests performed, see the How We Test description in the chart on page 25.



WE TESTED INTEL'S NEW but performance-challenged 1.7-GHz Celeron processor on a preproduction Gateway 300S.

Analysts say consumers should not be amused.

"I think Intel's handling of [this] Celeron represents a complete disregard for its customers," says Kevin Krewell, senior analyst at MicroDesign Resources. "The 128KB of L2 cache is simply Intel crippling the processor's performance to make the latest Pentium 4 look better. It would be like going to a car dealer and finding that the economy car has only half the cylinders enabled."

At the same time that 1.7-GHz Celeron systems ship, you'll also see PCs based on a new version of the old-style Celeron running at 1.4 GHz. Although it uses the old 100-MHz frontside bus, it retains the 256KB Level 2 cache, so PCs powered by this chip should outperform systems equipped with the new 1.7-GHz Celeron, Krewell says.

Bottom line: If you want a sub-\$1000 system based on a Celeron, the 1.4-GHz chip looks like the smarter option. Before you buy either one, however, shop around for sub-\$1000 systems based on Intel's older P4 chips or AMD's Athlon processors. Most of them will easily outperform computers running on either flavor of the Celeron.

and USB 2.0 support to some. For the details, see "Fast Bus, Same Fare," on page 23.

## P4 TOPS TESTS

TO COMPARE the latest CPUs of each chip maker, we pitted a preproduction Falcon Northwest Mach V system carrying a 2.53-GHz Pentium 4 CPU and 256MB of 266-MHz DDR memory against a nearly identical preproduction Mach V with a 1.73-GHz Athlon XP 2100+ chip and 256MB of 333-MHz DDR RAM. Each PC ran Windows XP Professional and included an NVidia GeForce4-based graphics card that held 128MB of DDR RAM.

The P4-based Falcon system earned a PC WorldBench 4 score of 121, edging past the Athlon-based Falcon's 119; you wouldn't notice that difference in most applications. Our multimedia tests were nearly a wash: Each PC won three tests, and the seventh ended in a tie, although the P4 PC offered a slight advantage to digital multimedia users.

Each Falcon system came in a pricey aluminum case with a fancy paint job that is geared toward buyers who want looks as well as performance. However, at \$2975, the P4 PC (with a 17-inch monitor) still costs \$500 more than the Athlon unit with the same monitor. Two points just isn't much bang for an extra \$500.

## GET ON THE BUS

TO SEE HOW much the new bus actually affects performance, we looked at preproduction systems from Gateway and Hewlett-Packard that supported both the 400-MHz and the 533-MHz bus speeds.

We examined a \$2113 Gateway 700S with Windows XP

Professional, 256MB of PC 800 RDRAM, and an NVidia GeForce4-based graphics board with 128MB of DDR RAM. We tested it twice: with a 2.4-GHz P4 and a 400-MHz bus, and with the same chip and a 533-MHz bus. With the faster bus, the PC earned a score of 115; with the slower bus, it earned a score of 114—an imperceptible difference.

Then we tested a \$1784 HP Pavilion 752 configured with Windows XP Home, 256MB of 266-MHz DDR RAM, and an NVidia GeForce3-based graphics card carrying 64MB of DDR RAM. Each chip/bus combination earned the identical score of 115.

Both HP and Gateway say our test PCs will ship exclusively with the new bus by June. However, the bottom line is that the bus didn't help the P4 PCs run productivity applications faster in our tests.

Also worth noting: A similar HP Pavilion 702 system based on the Athlon XP 2000+ chip edged past both of our 2.4-GHz Pentium 4 PCs, earning

a score of 117. This \$1464 HP machine—configured nearly the same as our P4 Pavilion—would save you over \$300.

### AUTOCAD ADVANTAGE

WE GAVE INTEL'S new 533-MHz frontside bus an additional chance to strut its stuff in our multimedia benchmark tests. Unfortunately, we saw only one score improve—in the AutoCAD test.

Using the new bus, the Gateway completed the AutoCAD test in 321 seconds; using the older bus, the same system took 330 seconds. Likewise, the HP finished with times of 318 seconds and 328 seconds, respectively.

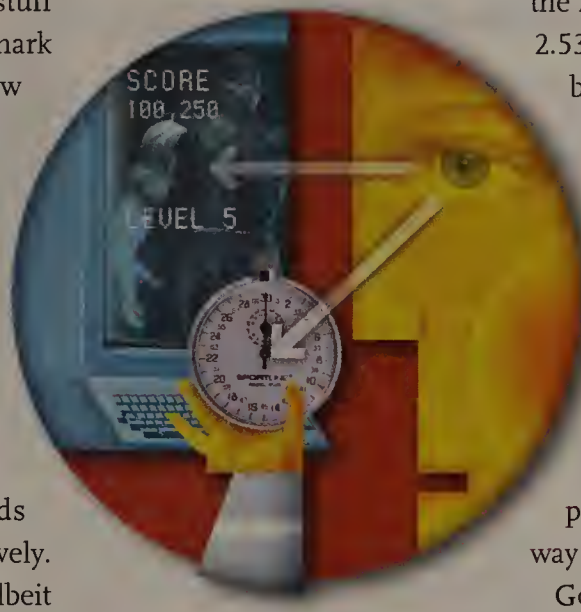
While that is a boost—albeit a fairly modest one—the new bus provided no significant improvement in other tests.

The faster bus speed doesn't matter much on most applications now, but that situation could change in the future, says MicroDesign Resources senior analyst Kevin Krewell.

"The lack of a 'pop' [from

the] bus speed increases is due to memory bandwidth limitations," he says. Future technologies could end that.

The most significant future improvement could be in PCs that use PC 1066 RDRAM or DDR-333 with dual-channel



support, Krewell says. Intel has yet to validate PC 1066 for the 850E chip set, however, and it hasn't even announced support for DDR-333 yet.

### YOUR NEXT MOVE

ANALYSTS EXPECT Intel to remain dominant in chip speed this year. But for computer

users who are more impressed by performance than by speed, AMD-based PCs should continue to be the better value.

Intel-only PC buyers should consider a system with a 2.4-GHz P4 (with 533-MHz bus support) instead of one with the 2.53-GHz chip. While our 2.53-GHz Falcon offered the

best score at 121, the comparable—if less flashy—

2.4-GHz Gateway PC trailed by a scant six points, giving the Falcon a mere 5 percent advantage. Even if the

Falcon's fancy case is replaced with a standard one—dropping the price to \$2314—the Gate-

way still saves you about \$200.

Going forward, the competition for top performance marks should keep the battle between Intel and AMD interesting. Plus, the rivalry should help keep downward pressure on PC prices, which means that—even if you can't afford to buy now—speedy and well-priced systems shouldn't disappear anytime soon. ►

## TEST REPORT

### 2.53-GHz P4 SYSTEM CATCHES AMD RIVAL

| SYSTEM                  | Processor               | Frontside bus speed (MHz) | PC WorldBench 4<br>Faster | Musicmatch Jukebox 7 (seconds) | Adobe Photoshop 6.0.1      |                            | AutoCAD (seconds) | Windows Media Encoder 7.1       |                                 | Unreal Tournament 4.36 (frames per second) |
|-------------------------|-------------------------|---------------------------|---------------------------|--------------------------------|----------------------------|----------------------------|-------------------|---------------------------------|---------------------------------|--------------------------------------------|
|                         |                         |                           |                           |                                | Lighting effects (seconds) | Multiple filters (seconds) |                   | Audio file conversion (seconds) | Video file conversion (seconds) |                                            |
| Windows XP Professional | Falcon Northwest Mach 5 | 2.53-GHz Pentium 4        | 121                       | 18                             | 52                         | 67                         | 299               | 56                              | 55                              | 99                                         |
|                         | Falcon Northwest Mach 5 | 1.73-GHz Athlon XP 2100+  | 119                       | 22                             | 48                         | 61                         | 298               | 62                              | 63                              | 99                                         |
|                         | Gateway 700S            | 2.4-GHz Pentium 4         | 115                       | 19                             | 56                         | 72                         | 321               | 64                              | 60                              | 74                                         |
|                         | Gateway 700S            | 2.4-GHz Pentium 4         | 114                       | 19                             | 56                         | 71                         | 330               | 65                              | 61                              | 74                                         |
| Windows XP Home         | HP Pavilion 702         | 1.67-GHz Athlon XP 2000+  | 117                       | 23                             | 50                         | 65                         | 315               | 63                              | 63                              | 72                                         |
|                         | HP Pavilion 752         | 2.4-GHz Pentium 4         | 115                       | 19                             | 58                         | 71                         | 318               | 59                              | 59                              | 71                                         |
|                         | HP Pavilion 752         | 2.4-GHz Pentium 4         | 115                       | 18                             | 58                         | 72                         | 328               | 59                              | 60                              | 69                                         |

### TEST Center

**HOW WE TEST:** All systems included 256MB of memory. We tested all systems with PC WorldBench 4, PC World's applications-based benchmark. Go to [www.pcworld.com/benchmark](http://www.pcworld.com/benchmark) for more details on PC WorldBench 4. In the Photoshop 6.0.1 lighting effects test, we time the running of a macro that applies a series of lighting effects to a 1.6MB image file; in the multiple filters test, we time the running of a macro that applies a series of filters to the same image. In the AutoCAD test, we time AutoDesk Group International's AUGI Gauge benchmark, which runs CAD tasks. In the Musicmatch encoding test, we time the conversion of a 14.3MB .wav file into an .mp3 file using Jukebox 7. Using Windows Media Encoder 7.1 (in Windows Media 9 format), we time the conversion of an 8.9MB .mp3 audio file to .wma format; in a separate test, we time the conversion of an 11.2MB .avi file to .wmv format. In the Unreal Tournament test, we run our own demo of the game. A higher score on PC WorldBench 4 and on Unreal Tournament is better; elsewhere, lower is better. All rights reserved.

## CD-RW

# DRAG 'N' DROP TO CD-RW EASILY

**NEW TECHNOLOGY PROMISES SIMPLE FILE TRANSFERS, NEAR-ZERO FORMATTING TIME.**

CREATING and sharing CD-RWs just got easier. Thanks to a new technology, users have a simple and consistent way to transfer files through Windows Explorer, or save a file to CD-RW from an app—with confidence that other new CD drives will be able to read the disc. More important, CD-RW formatting time is cut to practically nothing because you can start copying files before formatting is done.

The new standard is code-named Mt. Rainier (aka Easy Writer), and some 40X-rated CD-R/RW drives from vendors such as Philips and Teac already support it (you may need a firmware upgrade to make it work, so check with

vendors). Nearly all the forthcoming 48X-rated CD-R/RW drives should offer built-in Mt. Rainier support, and the whole market will eventually follow. Even some rewritable-DVD drives, such as next-generation DVD+RW models, will include Mt. Rainier.

A key benefit of Mt. Rainier drives: no need for a CD-RW packet-writing program to let you drag and drop files to disc—that is, once operating system support is built in.

And that's the catch. You can buy software that lets you take advantage of Mt. Rainier, but native OS support—which makes the process seamless—lags. (Today, only the Linux 2.4.19 kernel offers support.)



Microsoft promised support in Windows XP but did not include it; a company spokesperson said a reader driver is on the way, and the next Windows, code-named Longhorn, should include full support.

## WORK IT NOW

YOU DON'T have to wait for Microsoft. With Software Architects' WriteCD-RW Pro, version 3 (\$70; \$40 for an upgrade), you can use most of Mt. Rainier's nifty features

now. (Roxio Easy CD Creator 5.2 also supports Mt. Rainier.)

WriteCD-RW Pro has three utilities to let you write a Mt. Rainier disc, read it in a non-Mt. Rainier drive, and recover lost files or repair discs of various formats. It works with Windows 98, Me, NT, 2000, and XP, and Mac 8.6 and 9.x.

I still had to format discs, but it took less than 5 minutes, compared with an average of 20 minutes or more for most packet-writing utilities. And I had no trouble copying files as the disc formatted. You can even interrupt formatting—it resumes at your next session with no data loss.

Copying and saving files was a breeze. And after I installed SAI's read utility on another PC, both a CD-RW and a DVD-ROM drive that had no Mt. Rainier support or other UDF (Universal Disc Format) software read my new disc.

The full promise of Mt. Rainier is still that—a promise. But SAI's utilities offer many of the technology's benefits now, and may also soon ship with drives as part of the software bundle—a plus for users and their wallets.

—Alexandra Krasne ►

## UPDATE

# CD-RW: WHAT'S NEXT

MT. RAINIER technology is just one new feature coming to CD-R/RW drives. Look as well for faster CD-R and CD-RW write speeds, and perhaps fewer media delays than in the past.

Drive makers CenDyne and TDK expect to be shipping 48X-rated CD-R drives around the time you read this, with other vendors sure to follow. Media for these 48X drives should appear at about the same time, say media vendors.

CenDyne's first 48X drives will write CD-RW at 12X; a 48X/24X drive should appear a month later, say company spokespeople. TDK hopes to launch its 48X drives with 24X CD-RW capability.

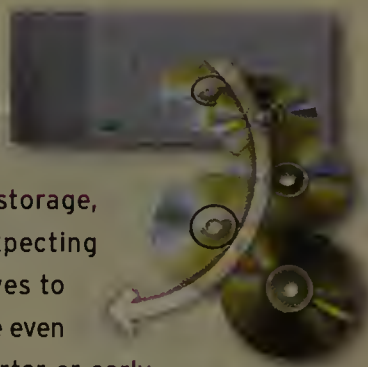
Specifications for 24X CD-RW have not been finalized and may delay release of the drives. Consequently, Mary Craig, Gartner Dataquest

principal analyst for optical storage, believes that expecting 24X CD-RW drives to become available even by the third quarter or early fourth quarter of this year may be optimistic.

Don't look for anything beyond 24X for CD-RW for a while. Industry experts agree that CD-R write speeds may jump—perhaps to 52X or even 60X—but they won't roll out as quickly as they have over the past year, when speeds tripled from 16X to the imminent 48X.

If that's not enough speed for you, it may be time to start looking at a rewritable-DVD model.

—Anush Yegazarian



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— PC Magazine

"...a genuine breakthrough"

— PC World

"Unbelievably cool!"

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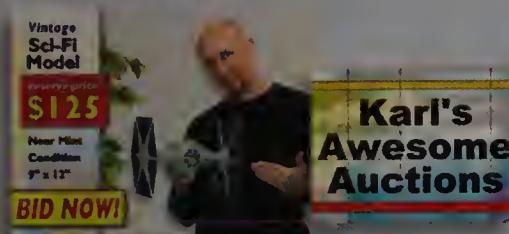
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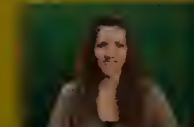
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## LCD MONITORS

# LARGE LCDs WITH EXTRAS

STYLISH 18-INCH LCDs INTRODUCE FEATURES FOR DEMANDING USERS.

SHARP AND NEC-Mitsubishi are raising the bar for LCD flat-panel monitor design, with enhancements to color reproduction in one case and improved management features in the other. At \$1299 each, the NEC MultiSync LCD-

other premium units, however, such as the \$1899 Eizo Nanao FlexScan L685.

Sharp's new LL-T1820 is the first LCD monitor with built-in gamma correction, which lets it display a broader range of colors than other models do.

medical imaging. Used in tandem with color-calibration software, the technology could also translate into more-accurate color prints.

The MultiSync LCD1880SX is the first LCD monitor to make use of an updated version of Windows Plug and Play installation technology, called Display Data Channel/Command Interface (DDC/CI), that allows two-way communication between a monitor and a system via keyboard and mouse—from the desktop or even over a network (the latter requires an analog hookup). We were unable to test this feature because the software wasn't ready in time for us to review, but NEC-Mitsubishi says it lets you adjust settings such as color and contrast more quickly than you could by using traditional front-panel buttons. The software also includes test patterns and adjustment previews, both of which make fine-tuning images easier.

## FINE-TUNED COLOR

IN COMPARISON tests, both monitors produced excellent text and images. Colors on the Sharp looked marginally better than those on the NEC, and the Sharp's controls permitted greater fine-tuning of color settings than those on typical 18-inch LCDs. The NEC, on the other hand, was better at displaying light and dark shades in gray-scale pattern tests. But the differences in image quality between either



**LEAN LOOKS:** Bezels less than 1 inch wide frame the Sharp LL-T1820 (left) and the NEC MultiSync LCD1880SX 18-inch LCD monitors.

1880SX and the Sharp LL-T1820 cost a few hundred dollars more than most 18-inch models—including the \$949 ViewSonic VG181, a Best Buy in March ([find.pcworld.com/28421](http://find.pcworld.com/28421)). They're cheaper than

### NEC MultiSync LCD1880SX

(Preproduction unit, not rated)

Street: \$1299

[find.pcworld.com/28541](http://find.pcworld.com/28541)

### Sharp LL-T1820 LCD Monitor

(Preproduction unit, not rated)

Street: \$1299

[find.pcworld.com/28542](http://find.pcworld.com/28542)

Conventional LCD monitors display a 24-bit image from a palette of 16.77 million colors, based on the use of 8 bits of color data per red, blue, and green subpixel (the components of a pixel). Sharp's new model, while still displaying a 24-bit image, can draw from a palette of 1 billion colors, based on the use of 10 bits per subpixel. The result, the company says, is superior color saturation and more detail in both shadow and highlight areas—ideal for applications such as publishing and prepress, graphic design, and

## IN BRIEF

## Pipeline

**SHIRT-POCKET PC:** The 9-ounce OQO Ultra-Personal Computer—about the size of a deck of playing cards—is a full-blown Windows XP Pro PC with a 1-GHz Transmeta Crusoe chip, a 4-inch LCD monitor, 256MB of RAM, a 10GB hard drive, IEEE 1394 and USB ports, and built-in 802.11b and Bluetooth wireless adapters. OQO hopes to license the design to a major PC vendor in time to ship for the 2002 holiday season.



one and the more affordable ViewSonic VG181 were more subtle than dramatic.

Both of these sleek, attractively designed LCDs feature slim bezels (about half an inch for the NEC, 0.7 inch for the Sharp), and 170-degree viewing angles (horizontally and vertically)—generous for LCD monitors. Each screen easily tilts, swivels, and pivots from landscape to portrait orientation. Both monitors provide a native resolution of 1280 by 1024 pixels, and both offer all-digital (DVI) as well as analog (VGA-style) inputs. The NEC provides extra connectors so you can attach two computers at the same time.

Those needing precise color should consider the Sharp LL-T1820; network administrators should check out the NEC MultiSync LCD1880SX. For the rest of us, the ViewSonic VG181 remains a solid and more affordable choice.

—Richard Jantz ►

# THE ROAD NEVER TRAVELED.

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At twice the resolution of the nearest competitor, the Z65 photo printer doesn't just break the rules, it changes the game altogether. The Z65 offers 4800 dpi\* (5.8 megapixels) of resolution, dual paper trays, plus Lexmark's legendary speed — all this for less than \$200. Available from Best Buy, Circuit City, CompUSA, Dell, Office Depot and Staples. For more information about Lexmark products, visit us at [www.lexmark.com](http://www.lexmark.com).

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## CONSUMER ALERT

# PAYPAL'S PROBLEMS

## CUSTOMER SERVICE WOES CONTINUE TO PLAGUE POPULAR PAYMENT SERVICE.

IF YOU'RE among the roughly 16 million people signed up to use PayPal, you know how handy the online payment service can be, and chances are, you've never had a problem.

That said, customer service has long been a trouble spot for the company, as we reported last October in *Consumer Watch* (head to [find.pcworld.com/28721](http://find.pcworld.com/28721)). And although PayPal says it has improved its service, two law firms have launched class-action suits against the company because of customer service problems.

Sheila Stawicki of Woodville, Alabama, knows those problems firsthand. She used PayPal without a hitch for two years. But in January someone fraudulently accessed her PayPal account and liberated \$3000 from her bank account. She recovered half the money through her bank, but needed PayPal's help with the rest.

After calling and e-mailing PayPal repeatedly for 45 days, Stawicki says she'd received only disconnects and canned replies. She got a refund after *PC World* contacted PayPal.

PayPal says Stawicki's case was an anomaly, caused partly by a now-complete move from paper to electronic affidavits. PayPal also added customer service staff: 280 agents are now available daily, says Vincent Sollitto, vice president of corporate communications. Most complaints are resolved within 24 hours, he says.

### LAWSUITS PENDING

THE TWO POSSIBLE class-action lawsuits paint a less-rosy customer service picture.

One suit, handled by Girard Gibbs & De Bartolomeo of San Francisco, alleges PayPal places barriers between itself and users, hindering those who experience problems. The

suit also contends PayPal goes overboard in its fraud prevention, sometimes erroneously freezing or closing accounts.

The other suit, filed by national firm Jacoby and Meyers, makes similar claims. Even without advertising the suit (it's unlikely to get class-action status for a few months), the firm already has nearly a thousand complaints about PayPal, says Gail Koff, a founding member of the practice.

PayPal's Sollitto says neither lawsuit has merit and they will be contested "vigorously."

PayPal has made a business decision to save money by offering sometimes inadequate support to users who aren't business-class, paying customers, says Avivah Litan, vice president and research director at Gartner Research.

Sellers pay per transaction, but buyers get to use PayPal's service for free. PayPal isn't concerned about losing some nonpaying users, Litan says.

Sollitto vehemently denies that PayPal offers poor service to any of its customers.

### NOT A BANK

PAYPAL'S customer service troubles highlight the fact that while PayPal looks like a bank, it has carefully avoided becoming one, says Steve Schutze, the American Banking Association's e-strategies director. Banks must abide by regulatory and internal audits, and by other rules, he says. But "there is no regulation that says they [PayPal] must work with you to resolve the problem."

PayPal's chief competitor, EBay Payments (formerly BillPoint), follows banking regulations because it outsources all payment banking functions to Wells Fargo, a national bank which once owned 35 percent of BillPoint. Citibank offers C2It, another rival, so it too falls under banking rules.

All in all, negative press over the pending suits and poor customer service don't seem to be diminishing users' appetite for PayPal. Gartner analysts project that the company, which debuted in 2000 with about 10,000 users, will reach 25 million users by 2003.

—Tom Mainelli ►

## HOW TO PAY IT SMART

ONLINE PAYMENT SERVICES are just too darn useful for many of us to give up. If you're going to use one, follow these commonsense tips.

- ◆ **Read the fine print.** If you see a privacy or service term you don't like or understand (a demand for your Social Security number, or e-mail-only customer service), reconsider signing up.
- ◆ **Protect your passwords.** Use different passwords for multiple accounts, make them tough to guess, change them often, and never share them. Broken passwords lead to most fraud.
- ◆ **See what others are saying.** Check a favorite auction site's message board, or visit AuctionWatch ([www.auctionwatch.com](http://www.auctionwatch.com)) or the Online

Traders Web Alliance ([www.otwa.com](http://www.otwa.com)) for user opinions. AuctionBytes also has payment service reviews at its site ([find.pcworld.com/28501](http://find.pcworld.com/28501)).

- ◆ **Don't use a debit card.** And think twice about giving the service your checking account information. Using only a credit card keeps your exposure low, and you can contest fraudulent charges. You may, however, have a spending cap.
- ◆ **Don't keep large sums in your account.** That way, if the service freezes your account, you're not out the cash while the problem is resolved.
- ◆ **Read your e-mail.** Don't assume a message from your payment service is spam. It could be your only warning that something is wrong.



## Wireless 802.11a, 54 Mbps



Access Point



PC Card Notebook Adapter



PCI PC Adapter



Cable/DSL Router

## Wireless 802.11b, 11 Mbps



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## DISPLAYS

## BIG-NAME PROJECTORS

NEW PORTABLE MODELS FROM DELL AND HP ARE SMALL, BRIGHT, AND GOOD DEALS.

PORTABLE PROJECTOR buyers have two new vendors vying for their business—or at least, vendors new to the projection business: PC giants Dell and Hewlett-Packard. We looked at early shipping versions of units from each company and found them to be worthy, attractively priced entries.

The Dell 3100MP ("MP" is for Microcomputer Projector) and HP's Digital Projector Xb31 are both made by the same company—Coretronic, a veteran projector maker that also builds models for Compaq and Optoma. The units both weigh about 3.5 pounds, and both use Texas Instruments' small but efficient Digital Light Processing (DLP) technology.

### HP BURNS BRIGHTER

THE MORE expensive HP boasts a brighter, longer-lasting lamp (see the chart below) and a higher contrast ratio than most DLP portable pro-

jectors, which means it can produce deeper blacks and richer, fuller colors. And while both models can easily project an image about 35 feet, making them suitable for small to medium-size group presenta-



**GOOD SHOW:** Dell (left) and HP models are worthy contenders in the crowded portable projector field.

tions, the HP Xb31 can handle a slightly bigger room.

Both projectors come with carrying cases and wireless remote controls. You can connect to a VCR, a DVD player, an HDTV receiver, or a TV tuner. Both have built-in 2-watt speakers, support wide-screen format, and are relatively quiet (38 dBA for the Dell and 35 dBA for the HP).

These projectors are good deals, too. They're as much as

a couple of thousand dollars less than some competitors—probably in part because Dell and HP have the clout to command volume pricing for components. Dell customers also benefit from the company's direct-sales model, which bypasses the reseller normally involved in projector sales.

In my tests, each projector delivered crisp and colorful PowerPoint presentations, digital photographs, and TV shows at a distance of 15 feet in a dimly lit room. But overall, the HP projector displayed better color saturation (for example, warmer reds, darker blacks, and more-accurate skin tones) and a wider variety of tonal information than the Dell.

Both projectors are ideal for traveling presenters, and both work as home-theater units (though not as well as more-expensive projectors designed expressly for that purpose, such as the InFocus LS-110). The HP's better image quality and brightness justifies its \$1200 premium over the Dell.

—Richard Jantz ■

## IN BRIEF

### Pipeline

**DUO OF TREOS:** Handspring's hot Treo 180 has a pair of color siblings. The Treo 270, like its predecessor, is a Palm organizer and a GSM (and GPRS-ready) phone; expect to pay around \$599 with a service plan. The \$299 Treo 90, with no integrated wireless capability, is slightly thinner and lighter than the others. The new Treos will be available only with keyboards: Handspring says keyboard-equipped Treo 180s far outsell the Graffiti-based Treo 180g.

**FAST AND CHEAP:** Samsung's new ML-1430 is a fast and unusually affordable laser printer. The company rates the \$199 unit's print speed at 15 pages per minute—3 ppm faster than its popular ML-1210 model.



### Downloads

Head to [find.pcworld.com/27881](http://find.pcworld.com/27881) to find these files.

#### TOP 5

- 1 Pop-Up Stopper** 440KB  
Eliminate irritating pop-up windows with this freebie.
- 2 ReadPlease 2002** 9100KB  
Give your PC a voice with this text-to-speech utility.
- 3 DocMemory PC RAM Diagnostic Software** 250KB  
Test your PC's memory with this free diagnostic software.
- 4 Backup To CD-RW 4.0** 2659KB  
Save the contents of your hard drive on multiple discs.
- 5 IPWatcher** 219KB  
Display your current IP address and host name with this tool.

### BY THE NUMBERS

## DELL AND HP PORTABLE PROJECTORS

| MODEL                                                                                                 | Estimated street price | Weight (lb) | Resolution (native) | Brightness (ANSI lumens) | Lamp life / replacement cost | Warranty (parts and labor) |
|-------------------------------------------------------------------------------------------------------|------------------------|-------------|---------------------|--------------------------|------------------------------|----------------------------|
| Dell 3100MP<br>★★★★☆ <a href="http://find.pcworld.com/28461">find.pcworld.com/28461</a>               | \$2499                 | 3.5         | 1024 by 768         | 1050                     | 1500 hours/\$349             | 2 years                    |
| HP Digital Projector Xb31<br>★★★★☆ <a href="http://find.pcworld.com/28462">find.pcworld.com/28462</a> | \$3699                 | 3.4         | 1024 by 768         | 1500                     | 2000 hours/\$479             | 2 years                    |

<sup>1</sup> Time at which lamp reaches half brightness.

\_\_\_\_\_ The new Gateway desktops are here \_\_\_\_\_

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when the word "introducing"  
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you'd be able to see  
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**Introducing the Gateway® 700XL.**



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Chuck your TV.  
Don't demolish your  
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**Gateway**

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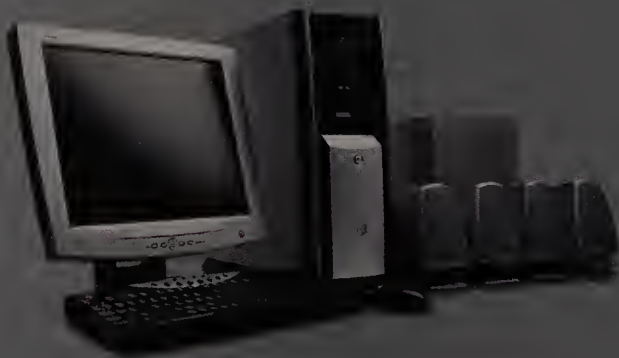
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## Gateway 500X

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<http://www.microsoft.com/piracy/howtotell>



[gateway.com](http://gateway.com) AOL Keyword: Gateway

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# LETTERS

LETTERS@PCWORLD.COM

## ULTRAPORTABLE MINI CARDS

## A KEYBOARD SOLUTION

## COULD NEW LAWS CAN SPAM?



### IN DEFENSE OF BACKUP NOW

AS THE DEVELOPERS of NTI Backup Now, we take issue with the results of the review in your May cover story, "Tools for Trouble-Free Computing." Backup Now is criticized for not marking files during a bad backup job (when an "in-use" system file does not pass the verification test following the backup). Contrary to the opinion of the reviewer, we view this as a strength rather than a weakness, as we chose to have the program guarantee the integrity of the completed backup before marking the files as backed up. Backup Now has another strength that was apparently overlooked: It is also a disk imaging utility. We recommend that system files be backed up with our drive image feature (data files are easily backed up with our file-level functionality). To purchase the article's Best Buy recommendations for file backup and disk imaging, one can spend \$149—or save \$79 and get NTI Backup Now instead.

The reviewer claims that Backup Now provides limited support for storage devices. But he also states that "the best way to deal with day-to-day backups is to use a CD-RW drive." We agree with the second statement completely; our product supports nearly three times as many CD-R/RW drives as the Best Buy winner does. Your readers are much more likely to find

that their CD recorder is supported by Backup Now.

We invite your readers to see our product for themselves. We offer a complete 30-day trial of Backup Now, available at our Web site: [www.ntibackupnow.com](http://www.ntibackupnow.com).

We want your readers to know, before buying

anything, that Backup Now meets their needs, in their computing environment.

*William Tanner, Product Marketing Manager  
NewTech InfoSystems*

### AN XCRUCIATING XPERIENCE?

I READ WITH great amusement Steve Bass's article recommending the upgrade to Windows XP [*Home Office*, May]. He fails to mention what an excruciating "xperience" it is. Let's see now: I have

upgraded in turn to Windows 3.11, Windows 95, Windows 98, and Windows 98 SE. All I did for each of those upgrades was close running applications, insert the CD-ROM, and follow the instructions.

To upgrade my system to Windows XP, according to Bass, I must do most or all of the following: Configure my BIOS, perhaps download a tool to configure my BIOS, download drivers and patches from vendors for all my peripherals, locate and download Windows 2000 drivers if the XP versions can't be found, disconnect any devices that are at least six months old (does that include the monitor?), reset all programs that load at start-up, reset them after the upgrade—and probably do a couple of other things too. And then, just like that, Windows XP will be up and running! And Bass has the nerve to say "XP is a great piece of software."

*Greg Sanders, via the Internet* ►

### HOT BUTTON

## Sounding Off on Those Web Ads

REGARDING MAY'S "It's an Ad, Ad, Ad, Ad World": No one would put up with television networks or cable companies if they could take control of your television during commercials. Everyone would be mad if viewers could not control the volume, change the channel, or turn the set off during a commercial. That's what is happening with ads on the Internet. I would not mind an ad if it provided useful information or news. But I don't need another ad promoting a dating service, a spy camera, a credit report, or a triple-X site.

*Chuck Polage, Mt. Vernon, Indiana*

THE PROBLEM WITH pop-up ads is that no one looks at them! Among my clients, students, and colleagues (I am an attor-

ney/professor in e-commerce), none report doing anything to pop-ups other than trying to close them as quickly as possible. All report extreme irritation at the interruptions they cause.

At best, pop-ups generate negative brand awareness at the cost of customer loyalty to the firms and sites that use them. I will be unsurprised when many more online companies go out of business—and they may never know why.

*Dennis Owens, Staten Island, New York*

TO DISCOURAGE annoying ads, contact the advertiser via its 800 number and register your dissatisfaction. You can find unlisted 800 numbers with a little effort.

*Eric Schiller, Moss Beach, California*

### NEW USE FOR MINI MEMORY CARDS?

THE ARTICLE ON small memory cards ["Mighty Mini Media," *News and Trends*, May] suggests to me that they could easily replace other removable and portable media for PCs instead of being just for devices such as cameras and PDAs.

Remember the floppy disk? I see these cards as a very viable replacement for the floppy. It would be nice if PC manufacturers included read/write devices in their offerings for people who just want to work at home on that PowerPoint presentation without having to burn a CD or use a Zip drive. The CompactFlash standard seems perfect for this.

*John W. Hatcher, Arlington, Virginia*

### KEYBOARD GRIPES

I ENJOYED Stephen Manes's *Full Disclosure* column on keyboards [May]—I thought I was the only person who didn't

like the new keyboard layouts. I have transferred my IBM "buckling spring" keyboard to all of my new computers over the past six or seven years. You can find models with the feel of the old IBM keyboards at [www.pckeyboard.com](http://www.pckeyboard.com).

*Pierre Andre Jr., Orlando, Florida*

**Editor's note:** See this month's *Home Office* on page 55 for more on keyboards.

### CANNING SPAM

A POSTSCRIPT TO Bill Wallace's piece, "Can the Feds Can Spam?" [*News and Trends*, May]: The Federal Trade Commission is proposing a national "do not call" list for telemarketers and is soliciting comment via its Web site at [www.ftc.gov](http://www.ftc.gov). U.S. Rep. Nancy Johnson (R-Connecticut) is proposing similar federal legislation. I suggest that the greater problem is spam. A grassroots effort to include spam in broader "do not contact" rules could give us some well-deserved relief.

In the meantime, complain to the ISP

that is allowing the spam. Yahoo has useful generic instructions on how to complain to almost any ISP about spamming at [find.pcworld.com/28041](http://find.pcworld.com/28041).

*Dave Gliserman, Danbury, Connecticut*

### COVER ARTICLE FINDER

ONE OF MY pet peeves is the difficulty of locating cover articles in a magazine. I want to compliment you on your ultimate solution to this aggravation. In the May issue's table of contents, you have a front cover image and arrows with page numbers pointing to each item on the cover. This feature eliminates the confusion that often occurs when a cover description varies from the table of contents description. Three cheers!

*Hart Anway, via the Internet*

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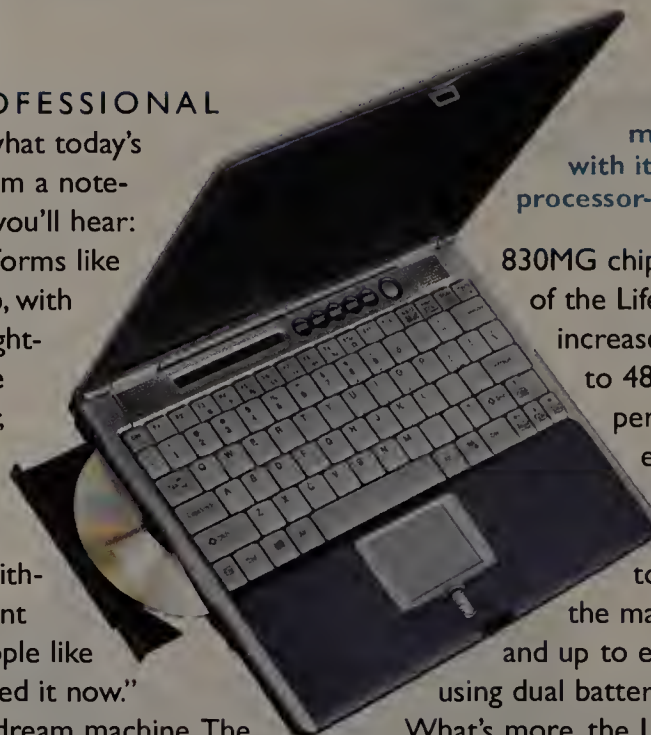
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The LifeBook S Series is the mobile professional's dream machine with its 1GHz Mobile Intel Pentium III processor-M.

830MG chipset, the processor-to-system speed of the LifeBook S Series notebook can be increased to 133MHz while delivering up to 48MB of shared memory for high-performance graphics on-demand, either in 2D or 3D. Despite these power innovations, the LifeBook S Series notebook still delivers up to four hours<sup>1</sup> of computing time on the main battery and up to eight hours<sup>1</sup> using dual batteries.

What's more, the LifeBook S Series notebook is ready for tomorrow, incorporating integrated, Wi-Fi-compliant wireless capabilities for true anytime, anywhere use. Along with modem and Ethernet ports, it gives mobile users the complete range of connectivity options for just about any environment.

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port is available 24x7, anywhere in the world, another unique way the LifeBook S Series notebook caters to professionals on the move.

The LifeBook S Series notebook is available with a one- or three-year international limited warranty that includes around-the-clock technical support. Users can also add a Fujitsu Premium Care Service Plan, with on-site service or a screen protection plan.

<sup>1</sup> Battery life estimates reflect the results of Ziff Davis Business Winstone 2001 BatteryMark 1.0 as performed upon systems with maximum battery life settings enabled. Actual battery life will vary based on screen brightness, applications used, features selected, power management settings, battery conditioning, and other customer preferences. CD, DVD, CD-RW, or hard drive usage may also have an impact on battery life.

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# CONSUMER WATCH

ANNE KANDRA

DOMAIN-NAME  
SHENANIGANS

PRIVACY WATCH:  
WIRELESS SPAM

ON YOUR SIDE: TOO  
MANY REMINDERS

## Don't Let Your Favorite Site Get Hijacked

Schemes, scams, and incompetence can trip up a Web site you love.



MAYBE IT'S THE home page for a business you've worked with in the past, or a site with information on helping your orchids thrive. But when you type in the URL and hit <Enter>, you're suddenly transported to a seamy Web site filled with raunchy pictures and seemingly inescapable pop-up windows.

What happened? It's a practice called a porn-napping, and it's just one of the unpleasant, shady, and sometimes illegal things happening to Web sites and their owners these days. Such activities can make owning a place on the Web—or

even surfing the Net—a dicey proposition. But don't despair. Whether you run a site of your own or you're thinking of creating one, I'll give you some tips on acquiring and keeping a domain name while avoiding hassles and scams.

On the Web, your domain name is your home. But some Web residents have been horrified to find their virtual homes turned into houses of ill repute. Netizens who fail to renew their registration, even if they miss the deadline by only a few hours, can find that a domain vulture has snapped up the name and linked it to X-

rated content. Then the porn site tries to hold the URL's good name hostage, offering to sell the address back to the original owner at an inflated rate (for more information, see [find.pcworld.com/26601](http://find.pcworld.com/26601)).

Another domain-related trap is just as sleazy—and downright illegal to boot. Earlier this year the Federal Trade Commission shut down a Web site that tried to cash in on users' post-September 11 patriotism by selling addresses that used a bogus top-level domain such as .usa or .brit in place of a legitimate suffix such as .com or .org (go to [find.pcworld.com/26602](http://find.pcworld.com/26602) for the full story).

### REGISTRY SLAMMING

DOZENS OF DOMAIN name holders are complaining about yet another practice—one that sounds disturbingly similar to the outbreak of telephone service “slamming” that occurred a few years ago.

The trick didn't fool Nate Griffith, director of operations for a business management firm in Salt Lake City. When Griffith received a letter in the mail from VeriSign, he immediately became suspicious. “The letter looked exactly like an invoice,” he says. “Even though I'd never done business with VeriSign, it stated that I had until April 19th to renew my domain name. Since I had originally registered it [for a year through Yahoo] in July of 2001, none of it made sense. I called the customer service number, and the representative explained that [VeriSign] had sent the letter to let me *switch* to VeriSign.” Griffith acknowledges that this information was “buried in the fine print” of his letter, but he still feels that the practice is unscrupulous. “Isn't this just a ►

cheap shot at consumers who might not even notice they're shelling out \$29 for a product they don't even want?"

Not according to VeriSign. When asked to respond to Griffith's comments, VeriSign spokesperson Patrick Burns said, "As the leading registrar [in the domain registry business], we reach out to potential customers to make them aware of our services and their value."

### DOMAINS HELD HOSTAGE

BUT NOT ALL of the obstacles facing domain holders are put there on purpose. Sometimes even the registry companies seem unable to keep track of their customers. Diane Brandon, a counselor in Durham, North Carolina, found that her domain name was effectively held hostage after Network Solutions, her original registry company, became involved in a series of corporate mergers and acquisitions. "When I went to Network Solutions' Web site to renew my registration, I got an error message and was unable to access

or manage the account," Brandon says.

Thus began a months-long ordeal involving hours of phone calls, reams of paper faxes, countless e-mail messages, four different domain registry companies, and even an attorney or two. The administrative problem stemmed from a botched customer record transfer during a period when Web hosting firm Interland partnered with Network Solutions, and it was eventually resolved. But for Brandon, who ended up switching to another registry and Web hosting company, the experience was frustratingly ironic. "At one point I was told that the whole situation happened because of a software glitch," Brandon explains. "The fact that nobody seemed to be able to fix that glitch for weeks when technology is their bread and butter simply does not add up."

As the domain name registry industry grows, we're likely to hear about even more scams, deceptive deals, and customer service woes. The following tips should help you sidestep trouble:

- Research registry companies carefully before you register a new domain name. Visit [www.internic.net/alpha.html](http://www.internic.net/alpha.html) for a full list of legitimate registry companies. Go to [www.regselect.com](http://www.regselect.com) to compare various companies' prices and services. And check out [www.webhostingratings.com](http://www.webhostingratings.com) for consumer reviews. At [find.pcworld.com/26621](http://find.pcworld.com/26621) you can get more information on choosing a hosting service.
- Keep up on domain name scams and other consumer news at [www.icann.org](http://www.icann.org), a site run by the Internet Corporation for Assigned Names and Numbers, a non-profit organization that manages names and addresses on the Internet. Here you can also make sure that any ads hawking a new top-level domain are legitimate. Currently, six ICANN-accredited top-level domains are available to almost any user: .com, .org, .net, .biz, .info, and .name.
- Check your domain name's Whois listing (at [www.internic.net/whois.html](http://www.internic.net/whois.html)) periodically after registering it. The listing tells you which registry company holds

### PRIVACY WATCH

## Wireless Industry Moves to Can the Spam

FINALLY, THERE'S SOME *good* news about spam. If that idea seems astonishing, you might want to sit down for this part: The news involves an industry volunteering to limit what could be the most pernicious kind of unwanted advertising yet invented.

You've probably heard about the potential nightmare of so-called location-based advertising sent to your wireless phone.

Here's how the scenario goes: As you walk past a fast-food restaurant, your cell phone, which by the end of this year should be able to calculate your location to within about 30 feet, lets the eatery know where you are. Suddenly your phone rings, not with a call from your mom, but with a coupon for 50 cents off on a cheeseburger.

The privacy risks of this type of advertising are obvious. Advertisers could collect data about where your phone (and you) go each day. It's creepy to think that, in theory, Weight Watchers—or your health insurance company—could know every time you stop at Baskin-Robbins.

But wireless industry trade groups are starting to show sensitivity to this issue, and not necessarily just because they're good corporate citizens. After all, the 118 million mobile phone users in the United States pay for the calls or messages they receive (in

Europe, the sender pays). If we got charged for the airtime used by incoming spam, it wouldn't be long before many of us canceled our phone service or looked for another provider.

Maybe that's why two trade groups in the wireless industry have recently taken tough-sounding stances on wireless ads. The Mobile

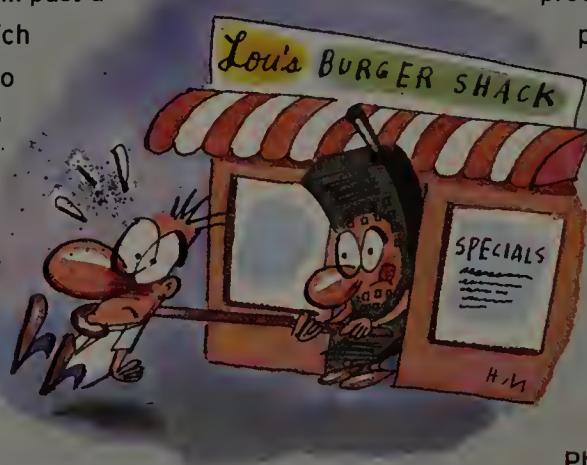
Marketing Association—a trade group comprising service providers, hardware makers, and some ad companies—wants its members to pledge not to

tie records of where you go to personally identifiable information (such as your phone number or name). Another group, the Cellular Telecommunications and Internet Association, wants the Federal Communications Commission to mandate that consumers must ask to receive ads via phone before companies send them.

I would take these proposals even further.

Phone companies should never bill any customer for the airtime consumed by wireless ads. Phone companies should never share customers' personally identifiable information with anyone except their own billing department. And please, give each user a single place to opt out of all advertising. These new rules would go a long way toward reassuring an anxious public.

— Andrew Brandt



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your domain name—useful information if the company you originally did business with got swallowed up in a merger and you missed the announcement.

- Keep careful track of the renewal dates for all your domain names. If you now use the URLs—or might someday use them—don't let their registrations lapse.
- Visitors judge you by the company you keep. So regularly check your site's links to ensure they still go to reputable sites.
- Report scams or questionable business practices to the FTC ([find.pcworld.com/28641](http://find.pcworld.com/28641)) and to the Better Business Bureau ([find.pcworld.com/28642](http://find.pcworld.com/28642)).

Just like your real-world home, your Web home should be your castle. Make sure that you keep it well protected. ■

*Anne Kandra is a contributing editor, Grace Aquino an associate editor, and Andrew Brandt a senior associate editor for PC World. Address e-mail to any of these three at [consumerwatch@pcworld.com](mailto:consumerwatch@pcworld.com).*

## ON YOUR SIDE

## McAfee, Stop Nagging Me!

I NEED YOUR HELP with my McAfee VirusScan Online subscription. McAfee bombards me with pop-up messages in Windows saying that my account information needs to be updated immediately (even though my subscription doesn't expire until November). I also got an e-mail indicating that the company no longer supports my McAfee antivirus program version 4. I'm unable to get any human response from McAfee and am on the verge of switching my service if this madness doesn't stop.

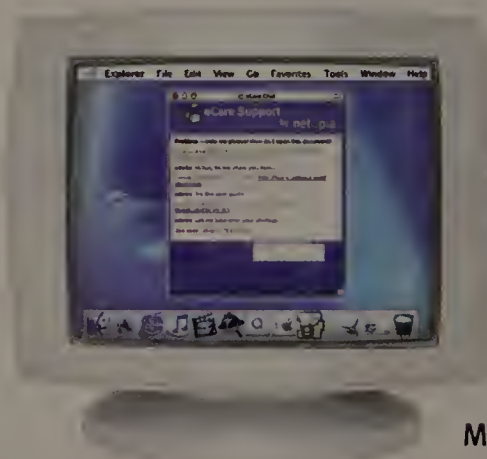
*Daniel Silvers, Pauls Valley, Oklahoma*  
**On Your Side responds:** I contacted McAfee.com on Silvers' behalf. Atri Chatterjee, vice president of marketing, says the company conducts programs that ask users—through a few auto-

matic pop-up messages—to update their personal information online. In Silvers' case, McAfee.com asked him to enter his credit card information in his online account so that if he renews his subscription he won't have to enter it. (Silvers paid with an electronic check when he signed up for the service.)

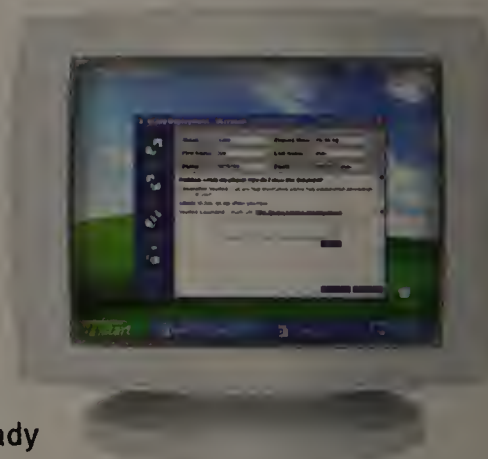
The company also sent Silvers an e-mail letting him know that his version of the program is no longer supported. McAfee.com has removed Silvers from its e-mail database so he will not receive company and product news in the future. Subscribers who wish to be removed from McAfee's database can write to [unsubscribe@mcafee.com](mailto:unsubscribe@mcafee.com) with the subject line "Unsubscribe."

—Grace Aquino

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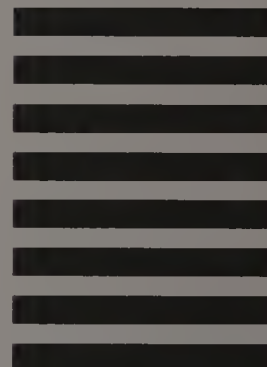
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PlexWriter 16/10/40A  
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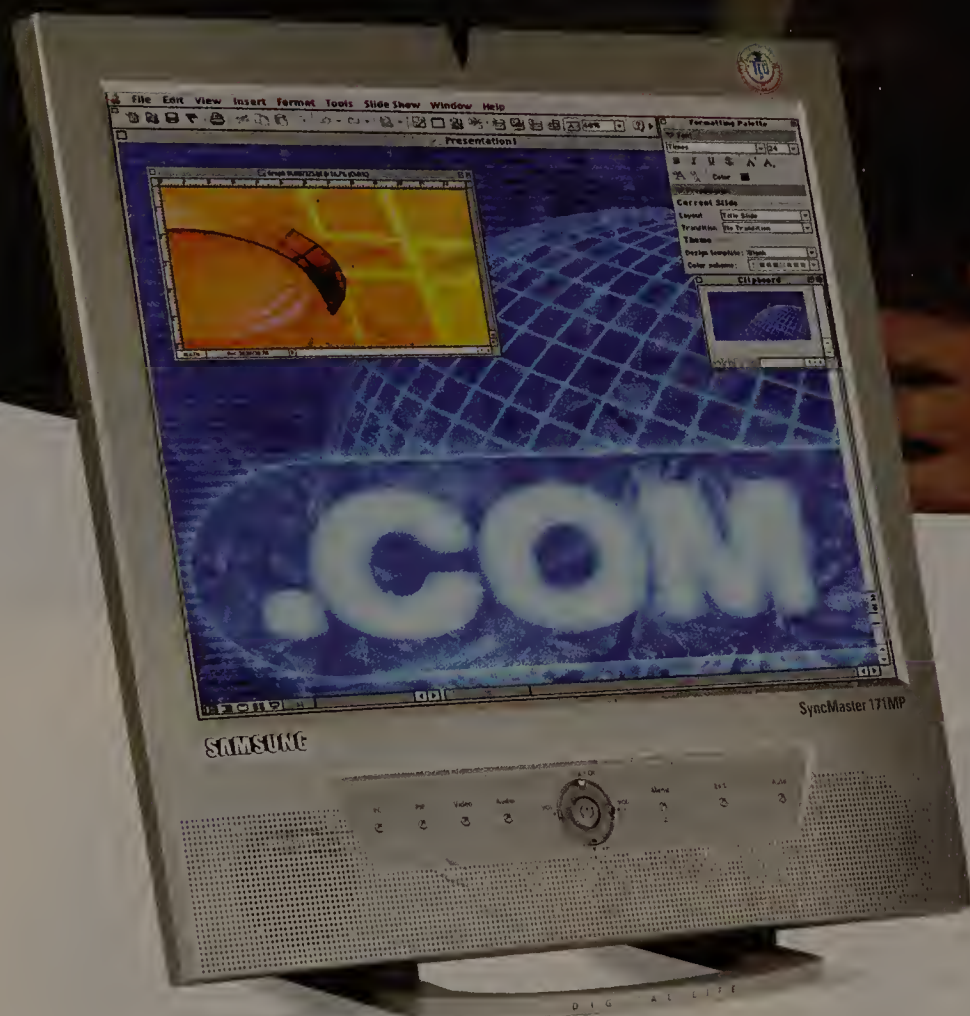
PlexWriter 24/10/40A  
November 2001



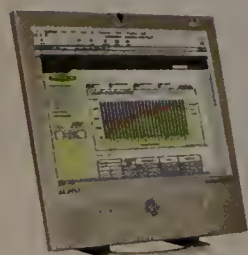
PlexWriter 16/10/40A  
January 2002

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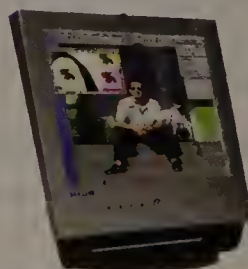
# DigitAllvision



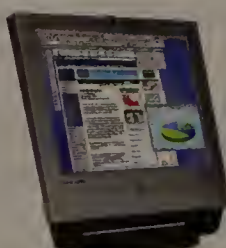
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151MP



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# Performance far beyond "built-in" limits

## TEST RESULTS

|                   | Windows 2000/XP<br>Built-in<br>Defragmenter | Diskeeper 7.0        |
|-------------------|---------------------------------------------|----------------------|
| SCHEDULING        | NONE                                        | AUTOMATIC            |
| SPEED             | SLOW                                        | 300-500%<br>FASTER   |
| THOROUGHNESS      | INCOMPLETE                                  | DEFRAGS<br>ALL FILES |
| RESOURCE<br>"HIT" | HIGH                                        | TRANSPARENT          |

## Built-in limits can create performance barriers...

Why? Built-in defragmenters require system admin privs to run, but cannot be run remotely. They drain system resources when running, but need to be run daily. Today's system demands require a fast, transparent and *automated* defragmenter—something a "lite" defragmenter can't deliver. Diskeeper® 7.0 is so advanced it runs itself, precisely when needed, anywhere on the network. It's like hiring an expert to constantly monitor system performance and keep it peaking—with increases up to 200% or more.

**What does Microsoft® say?** "The version included with Windows 2000 provides limited functionality in maintaining disk performance..." "If you need to automate the disk defragmentation process, obtain a third-party disk defragmenter tool." — *Microsoft Knowledgebase articles Q227463/Q223146*

**Can you really afford to use a manual defragmenter?** "The decision to defragment the enterprise automatically versus manually will save companies thousands if not millions of dollars." — *IDC*

### The Bottom Line:

"These tests clearly show... Diskeeper is a better product for defragmentation."  
—Lloyd Holder,  
CEO of NSTL

For less than the cost of a minor memory upgrade Diskeeper could be increasing the speed of your system now—automatically!



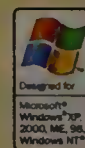
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## Finally, Real Relief From Spam

One Web service and a little common sense give peace of mind.

FEW THINGS MAKE my blood boil more than an unsolicited e-mail message like, "You have received this e-mail because you have registered with Karizma Offers or subscribed through one of our marketing partners." Not true. I've never heard of Karizma Offers, and I religiously opt out of e-mail campaigns when I buy products or sign up for services online.

For years I dealt with spam very simply: If a message was clearly junk, I deleted it immediately. But then junk marketers like Karizma started insisting I'd asked for it—and that was the last straw. With some trial and error, a unique new Web service, and a little common sense, I've finally cut the flow of spam to a trickle.

### A FILTER AND THEN SOME

ALTHOUGH GOOD spam filters can help fight unwanted e-mail, they're never perfect and spammers can outsmart them. But what if spammers never get your real e-mail address? Recently my editor turned me on to Mailshell ([www.mailshell.com](http://www.mailshell.com)), a powerful service using that idea to do more than just filter spam.

When you sign up for Mailshell's \$35-per-year premium service, you provide an existing e-mail address and register a new Web domain ("@bradgrimes.com," say). With a simple form, you can then create an unlimited number of e-mail addresses at your new domain. For instance, if I register for Karizma Offers (yeah, right), I put down [Karizma@bradgrimes.com](mailto:Karizma@bradgrimes.com). If Karizma or its partners barrage me with junk, I just delete that address.

#### Mailshell

★★★★☆

\$35 a year

Mailshell

[www.mailshell.com](http://www.mailshell.com)

The dummy addresses forward to my real e-mail account, which I still



use to send and receive mail. But now I have a measure of control over what reaches that account.

For the easy-to-wield control it offers, Mailshell is worth its cost (a 30-day trial is free). Sure, you can get your own domain from an ISP and do much the same thing, but maintenance can be cumbersome, and you won't save much money.

### BE BRAVE AND OPT OUT

MAILSHELL IS most effective if you start with a new e-mail address. For spam that started before your Mailshell account did,

### GIMME ADVICE

## Confirm Those Hotel Reservations

IN MAY I USED this space to tout Expedia.com for hotel deals. Since then, my family and friends have used Expedia seven times to book rooms. Four of those times resulted in problems. Most were small (wrong number of rooms, wrong number of nights). But in one case, friends I was traveling with didn't have a room at

the service acts as little more than a filter—albeit a good one. So besides using Mailshell, I've done the inadvisable: I've asked spammers to leave me alone.

At *PC World*, we frequently tell readers *not* to ask spammers to remove them from mailing lists because it only confirms that your e-mail address is active. I'd still never reply to anything XXX or Viagra-related, but what I have begun to do is opt out of spam that I get from "legitimate" marketers.

In general, if the spam comes in HTML format and includes a link for opting out of future messages, I figure it's not from a sleazy marketer pounding out spam in his basement. For instance, I opted out of e-mail from Karizma Offers and haven't been bothered since.

I also asked the Direct Marketing Association to remove my addresses from national lists through its E-Mail Preference Service ([find.pcworld.com/27781](http://find.pcworld.com/27781)).

Bottom line: I used to receive about 30 junk messages a day before taking these steps. On the day that I wrote this column, the tally was exactly one. ■

Contact PC World Contributing Editor Brad Grimes at [websavvy@pcworld.com](mailto:websavvy@pcworld.com).

all. It seems problems arise in the communication between Expedia and hotels.

In the end, Expedia took good care of my friends, and I still swear by its service. My advice? Use Expedia and other travel sites to book hotel rooms—the special rates are tremendous. But when that's done, call the hotel itself to confirm.

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CREATIVE



STEVE BASS

# Treat Your Fingers to a New Keyboard

'Penny-wise, pound-foolish' goes for your favorite input device, too.

YOU'RE GOING TO think I'm nuts (what else is new?), but I want you to plunk down \$189 for a keyboard. Before you suggest I up my meds, consider this: You wouldn't think of doing without that LCD monitor you paid a little extra for, would you? (If you're still CRT-bound, my sympathies to your tired eyes.) Just as important to your productivity—and your health—is a solid, well-designed keyboard. As luck has it, there are two on the market that are worth the extra dough (my second choice costs just \$45).

The keyboards that ship with most PCs are torture to use: mushy-to-the-touch feel, tiny <Backspace> key, narrow spacebar, and weirdly placed backslash key (\). (For another look at what's wrong with keyboards, see Stephen Manes's May *Full Disclosure* at [find.pcworld.com/27121](http://find.pcworld.com/27121).)

By comparison, my 12-year-old Northgate OmniKey Ultra keyboard has a sharp, crisp feel because of its clickity-clack mechanical keys. Its backslash key is placed under a large L-shaped <Enter> key, and the <Backspace> key is double-size.

Northgate is long gone, but the Northgate keyboard has been resurrected by Creative Vision Technologies. The company's \$189 Avant Stellar has the same great feel as the OmniKey, along with features that let me get things done fast, starting with two sets of function keys—12 across the top and another 12 in a double row down the left side. (My feng shui consultant approves, provid-

ed the keyboard faces east.) The keys on the side make it a breeze to touch-type <Ctrl>, <Alt>, and function-key combinations in Windows, Word, and other programs. For example, I can do a <Shift>-<F7> spelling check or close an app with <Alt>-<F4> while blindfolded.

## A REORDERING OF THE KEYS

THE AVANT STELLAR allows me to remap any key to any other key. For instance, I much prefer having the <Ctrl> key to the left of the letter 'A', exactly where God and IBM (no longer synonymous) first thought it should go. *Très cool, non?* I can also create short macros that let one key represent many keystrokes. The Avant Stellar uses a PS/2 connection and works with all versions of Windows.

If you're not as enamored with the Avant Stellar as I am, Microsoft's \$45 Office Keyboard makes a good second choice. The keyboard uses a logical layout, and its keys are just the right size. A row of buttons above the function keys either open or work inside Word, Excel, and other Microsoft applications, and a toggle key gives the function keys a second set of operations. There's also a clever keyboard scroll wheel and an 'Application' button—like the <Alt>-<Tab> and <Shift>-<Alt>-<Tab> keystrokes that cycle through your open apps—on the left side of the keyboard (to the dismay of left-handed mouse users). The downside? You better



like your keyboards large: These two are both big enough to snowboard on.

But what if you only want to remap your current keyboard? For anyone who *really* wants to get the upper hand on their key layout, there's Dev-Labs' \$15 Keyboard Remapper, which lets you remap almost all of your keys *and* add macros. And if you're a keyboard-shortcut kind of person (or would like to be), then grab a copy of Camtech's valuable KeyBoarding freeware, which lists 2900 keyboard shortcuts for Windows and Microsoft products. Go to [find.pcworld.com/12286](http://find.pcworld.com/12286) to download both of these programs (a trial version of Keyboard Remapper).

I'll have more remapping tools and keyboard shortcuts in an upcoming issue of my online newsletter. Go to [find.pcworld.com/25821](http://find.pcworld.com/25821) to sign up for it. ■

Contributing Editor Steve Bass is president of the Pasadena IBM Users Group. He can be reached at [homeoffice@pcworld.com](mailto:homeoffice@pcworld.com).

### Avant Stellar Keyboard

★★★★★

\$189

Creative Vision Technologies

[www.cvtinc.com](http://www.cvtinc.com)

### Microsoft Office Keyboard

★★★★☆

\$45

Microsoft

[www.microsoft.com](http://www.microsoft.com)

### Keyboard Remapper

★★★★☆

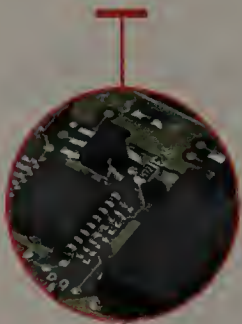
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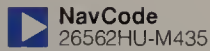


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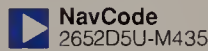
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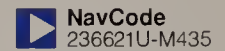
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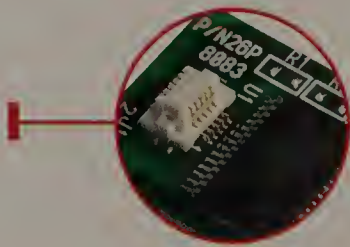
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# Falling Prices Making LCDs Mainstream

Award-winning displays from CTX lead the charge

**LCD panel prices fell dramatically in 2001,** driving tremendous demand for LCD monitors. This pricing trend has ceased its freefall recently, and we're now seeing 15" LCD monitors increasing somewhat while 17" and larger monitor prices have stabilized.

It will be some time before the supply of LCD panels can meet the demand, so, for the buyer considering upgrading to LCD, right now is actually a very good time to do so. CTX is making significant investments in manufacturing to provide a steady supply of quality LCD panels and monitors, and we hope that we can make LCDs more affordable when that capacity becomes available in 2003.

Computer users should consider carefully the benefits of an



**COMMITTED TO XCELLENCE™**

LCD display. Besides the obvious benefits—LCDs take less room, use less power, and look more appealing on the desk—LCDs also contribute to productivity with a flatter, flicker-free display, sharper images, and zero radiation. Beyond that, CTX enables users to pivot their LCD displays to the portrait orientation, thereby displaying about a third more of their documents.

Since the typical computer user works primarily with portrait documents, we have seen huge demand for this in our FlatView line.

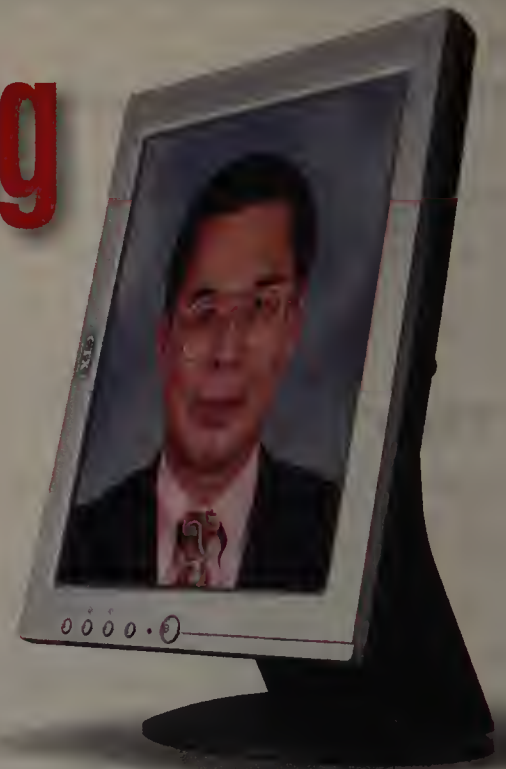
Our 17" FlatView monitor, the PV720A, recently won *PC Magazine's* Editors' Choice Award for best value. *PC World* also gave an enthusiastic review of its little sibling, the 15" PV520, in June 2002. People like these monitors because, first, they work with virtually all PCs and Macs flawlessly. Next, the products have our patented pivot function, allowing switching between portrait and landscape modes without unplugging any cables. We additionally bundle a full-function version of Portrait System's Pivot software; some vendors supply only a 30-day trial version that costs \$40 to use thereafter. Finally, the FlatView monitors are very attractive and match nicely with new computers from Dell and Compaq, which do not offer pivoting LCDs.

CTX recently launched a pair of 19" LCD monitors to meet the needs of users who want to see more data onscreen or simply

desire a larger display. The PV910 supports 1600 by 1200 resolution, which displays 46% more information than the typical 1280 by 1024 monitor. This is ideal for CAD/CAM engineers, professional services, and imaging. The SV900 model is more cost-effective and is great for presentations because of its brightness, contrast, viewing angle, and wall-mount support.

Switching to LCD monitors benefits most computer users. However, a CRT is preferable when color reproduction and refresh rates are of paramount importance, as they are for graphics designers and hardcore gamers. For that high-performance audience, CTX offers our Professional PureFlat series with FD Trinitron®. This is simply the absolute best display technology available and, after Sony, CTX leads the world in FD Trinitron monitors.

—Larry Wei



Larry Wei, President and CEO of CTX, pictured on the award-winning CTX 17" PV720A FlatView monitor.

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# BUGS & FIXES

STUART J. JOHNSTON

## Problems With QuickBooks and Money

Fix the latest snafus plaguing the Intuit and Microsoft financial programs.

AN ACCOUNTANT once asked me, "What's the difference between an accountant and accounting software?" His answer: "The software at least has some personality."

In today's financial programs you'll find lots of personality in the form of quirks and foibles—in short, bugs. Annoying glitches have surfaced in Intuit's QuickBooks and Microsoft's Money.

The first problem affects users of both QuickBooks Basic 2002 and the higher-end QuickBooks Pro 2002. If you used the online update feature recently, you may have run into weird behavior. The following message pops up: "You have recently downloaded a software update. Can we install it now?" You click 'Yes,' but nothing happens. Though you can still use

QuickBooks, you'll be asked to download the update every time you close the app.

To fix the problem, Intuit says, you must quit all programs and reboot your PC.



Then reopen QuickBooks and close it at once. You will be prompted to install the update; click Yes again. Still nothing happening? Then you need to restart QuickBooks

and download the update once more. But this time, type a set of keystrokes to reset the program. Go to [find.pcworld.com/27521](http://find.pcworld.com/27521) for Intuit's instructions. In addition, the company advises users to call its tech support line (888/320-7276).

The second problem affects people who use Microsoft Money 2002's Help option and Internet Explorer 5.5 or earlier. Within all 2002 versions of Money, when you select the Help menu, you may encounter the error message, "Internet Explorer script error." This blurb is followed by several lines of gibberish—and you're unable to get any farther with the Help option. The cause? One (or more) of the files IE needs to display Money's help files has become corrupted. You can still use the program, but Help won't be helpful.

Microsoft's recommended fix: Download IE 6, the latest version. Visit [find.pcworld.com/27501](http://find.pcworld.com/27501) to reach the link for the download. Of course, upgrading to IE 6 may not appeal to you if you're happy with an earlier version. But remember that version 6 incorporates most of the security updates and other patches that Microsoft has released. ■

Stuart J. Johnston is a contributing editor for PC World.

### IN BRIEF

#### Son of Klez

WATCH OUT for a new variation of the Klez worm called W32.Klez.h@mm. Like earlier versions, Klez.h spreads through your Outlook address book and ICQ. It can infect your PC if you preview an e-mail message. Klez.h may randomly send one of your files to people in your address book. Jump to [find.pcworld.com/27601](http://find.pcworld.com/27601) for McAfee's disinfection info and to [find.pcworld.com/27602](http://find.pcworld.com/27602) for Symantec's removal advice.

#### ¿Habla Worm?

IF A PERSON you know—especially someone who wouldn't know his *cabeza* from his *cerveza*—sends you an e-mail with a file attachment and a subject line in Spanish (*Mira esto, jajaja, te vas a reir*), delete the message. If you open it, don't launch the attachment, or you'll unleash a worm known as W32.Trilisa@mm. Go to [find.pcworld.com/27621](http://find.pcworld.com/27621) for Symantec's advisory and [find.pcworld.com/28382](http://find.pcworld.com/28382) for McAfee's removal steps.

### BUGGED?

FOUND A hardware or software bug? Tell us about it via e-mail at [bugs@pcworld.com](mailto:bugs@pcworld.com).

### WINDOWS XP CLASHES WITH USB MICE

SOME USERS OF Windows XP Home and Professional editions have reported system crashes when they shut down their machines. This glitch can happen to people who use a USB mouse and have XP's "USB selective suspend" option enabled.

You can work around the problem by disabling the selective suspend option. Hop to [find.pcworld.com/27581](http://find.pcworld.com/27581) to get Microsoft's instructions. The company has released a "hotfix" for the problem too, but advises you to install it only if you can't live without the suspend option. To get the hotfix, contact Microsoft tech support (800/936-5700) or your PC manufacturer (if XP was preinstalled on your PC and you're still covered for software support). If your warranty has expired—believe it or not—Microsoft may charge you for its help. Go to [find.pcworld.com/27561](http://find.pcworld.com/27561) for more details.

# NEW PRODUCTS

EDITED BY ANNE B. McDONALD

## DVD Burners: The Right Time to Buy?

REWRITABLE-DVD  
drives from HP (top) and Sony.



(3.324 MBps), CD-R at 12X, and CD-RW at 10X—significantly faster than most of the speeds the rival Pioneer drive offers, though the latter's all-important DVD-R write speed is comparable, at 2.77 MBps. The DVD+RW drives also support background DVD+RW formatting in hardware to save CPU cycles, and both DVD+RW/R discs take less time than DVD-RW/R discs to finalize when small amounts of data are written.

The chief differences between the new HP and Sony drives involve their outward appearance and their software bundles. Otherwise, both units have the same controls, back plate, and performance. The Dvd200i and the DRU-120A also share the ability to read both -R and -RW discs in addition to their native +R/+RW formats. You'll find this kind of bet-hedging throughout the DVD universe, as numerous drives and players play media that they don't officially claim to have compatibility with.

### SOFTWARE SIDE

HP BUNDLES the easy-to-use but somewhat limited Record-Now software for mastering data DVDs and CDs, and DLA (Drive Letter Access) for packet writing, both from Veritas;

### REWRITABLE DVD

SO YOU WANT to burn your home movies to DVD. You've patiently waited for drives capable of doing that to reach a price you can stomach—but now that they're hovering around a more affordable \$500 you still have to worry about sorting through a confusing standards conflict. When you see a promising deal, you may wonder, "Will this drive burn DVDs that play in my old player? Should I go with a DVD-RW/R or a DVD+RW/R drive? And what is the difference between them, anyhow?"

Take your time. I looked at

shipping second-generation HP Dvd200i DVD+RW/+R and Sony DRU-120A drives, both priced at \$499—the same as the competing Pioneer DVR-A04 DVD-R/RW drive that we tested last month (see [find.pcworld.com/26321](http://find.pcworld.com/26321)). My evaluations suggest that you may want to steer clear of the contest a bit longer. And if you're confused by the alphabet soup of formats, you're not alone (see "DVD As Easy As A-B-C" on the next page).

Before testing, my hopes for the HP and Sony drives were sky high. Their ability to write to DVD+R media—billed as

a potent combination of DVD+RW speed and DVD-R compatibility—was supposed to end the standards debate. But while the drives themselves performed impressively, the compatibility of DVD+R discs with DVD players fell far short of my expectations, and was inferior to that of DVD-R discs. And that is an important consideration: Why record discs you might have trouble playing later?

Both the HP and the Sony units burned DVD+RW and DVD+R at a blazing 2.4X

**62 REWRITABLE-DVD DRIVES**

Sony DRU-120A, Hewlett-Packard Dvd200i DVD+RW/+R

**64 DESKTOPS**

Compaq Presario 4000 and EMachines T1150 budget PCs

**66 VIDEO SOFTWARE**

Serious Magic Visual Communicator

**66 STORAGE**

Iomega HDD 30GB USB 2.0 Portable Hard Drive, Iomega HDD 120GB USB 2.0 External Hard Drive

**68 DIGITAL CAMERA**

Leica Digilux 1

**LINUX SOFTWARE**

CodeWeavers CrossOver Office

**72 UTILITY**

Ontrack Data International PowerDesk Pro 5

**72 PDA ACCESSORIES**

Logitech KeyCase and TypeAway keyboards

**74 MP3 JUKEBOXES**

Creative Labs Nomad Jukebox 3, Sonicblue Rio Riot

**75 UTILITY**

WS\_FTP Pro 7.5

Sonic Solutions' MyDVD for movie authoring; ArcSoft's ShowBiz video editor; HP's Simple Backup for backing up data; and CyberLink's PowerDVD for DVD movie playback. Sony offers BHA's B's Recorder Gold for mastering DVDs and CDs, and B's Clip for background packet writing; MedioStream's NeoDVD standard for authoring DVD movies; Dantz's Retrospect Express for backup; and CyberLink's PowerDVD for playing DVD movies. Sony's bundle is a bit stronger than HP's, but Sony doesn't offer an equivalent to the ShowBiz program for video editing, so the contest really is a toss-up.

**GOT A MATCH?**

IF YOU buy a DVD recordable drive to burn DVD movies, you'll want your recordings to play in as many drives and players as possible. Sadly, in my informal tests with 20 currently available DVD players, DVD+R media played in only 12, failing most notably in models produced by market heavyweight Toshiba. But my DVD-R disc played in all 20.

**DRU-120A**

Sony

★★★★☆

Writes quickly, but discs are less compatible than DVD-R discs.

List: \$499

[find.pcworld.com/28322](http://find.pcworld.com/28322)

**FEATURES COMPARISON****DVD AS EASY AS A-B-C**

| FORMAT  | Pro                                                                  | Con                                                                     | Best use                                      | Compatibility with DVD players <sup>1</sup> |
|---------|----------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------|
| DVD-RAM | Can be rewritten 100,000 times; has protective cartridge.            | Slow writes.                                                            | Archiving, DVR <sup>2</sup>                   | Poor                                        |
| DVD-R   | Fast; the most compatible with DVD-ROM drives and movie players.     | Slower close times in some cases; <sup>3</sup> can't be rewritten.      | DVD movies, sharing data, archiving           | Very good                                   |
| DVD-RW  | Can be rewritten 1000 times.                                         | Slower writes and close times; <sup>3</sup> less compatible than DVD-R. | Backup, DVD movie authoring, DVR <sup>2</sup> | Fair                                        |
| DVD+R   | Fast writes and close times. <sup>3</sup>                            | Less compatible with DVD players than DVD-R; can't be rewritten.        | DVD movies, archiving                         | Good                                        |
| DVD+RW  | Fast; can be rewritten 1000 times; background formatting in hardware | Less compatible with DVD players than DVD-R.                            | Backup, movie authoring, DVR <sup>2</sup>     | Fair                                        |

<sup>1</sup> Older drives and players are less compatible with all R/RW formats than newer hardware is. However, DVD+R can be read in some drives and players that aren't aware of any R/RW standard. <sup>2</sup> DVR refers to a DVD-Video Recorder, such as the Pioneer PVR-9000 or the Panasonic DMR-E10. <sup>3</sup> "Close time" refers to how long the drive takes to write file tables and prepare a disc for reading.

I also tested every legacy drive and player I could find. While DVD+R discs played in a surprising number of drives and players manufactured in 2000 or before that wouldn't play DVD-R, others played DVD-R but not DVD+R.

Performance, however, was a better story. DVD+RW write times on the HP and the Sony drives were about twice as fast as DVD-RW write times on Pioneer's DVR-A04; and CD-R/RW write times were also

considerably quicker on the HP and the Sony than on the Pioneer. DVD+R write times were slightly quicker than DVD-R write times, except on extremely small projects: The DVD+RW and DVD+R discs I burned using the disc-at-once method finalized more quickly when only small amounts of data had to be written.

**GAME SUMMARY**

UNLESS YOU'RE in a supreme rush to preserve some decaying videotapes, I recommend maintaining a wait-and-see strategy. Faster DVD-RW/R drives, as well as drives that write all four formats, are sure to come down the pike. If you're committed to buying now, I recommend choosing

between the Sony or the HP drives by considering which software package best suits your needs, since the hardware is so similar.

If backing up data is your only concern, a DVD+RW/R drive's superior speed makes it an excellent choice. At about \$7 each, however, DVD+R discs are significantly more expensive than DVD-R media, which currently run about \$2 to \$3 apiece. Moreover, if you want to share your data or home movies, a DVD-RW/R drive is probably your best bet. At the moment, using DVD-R media gives you the greatest chance of actually playing your home DVD movies in your DVD player.

—Jon L. Jacobi ►

**Dvd200i DVD+RW/+R**

Hewlett-Packard

★★★★☆

Less compatible, but faster than the DVD-RW/R competition.

List: \$499

[find.pcworld.com/28341](http://find.pcworld.com/28341)

# Buying Budget PCs: Dollars and Sense



A 17-INCH MONITOR enhances EMachines' T1150 system.

## DESKTOPS

WHEN IT COMES TO PCs, you sometimes get more than you pay for. And that's good news if you're looking for the least-expensive desktop you can find—if you need a second office PC, say, or one for someone brand new to computing.

We compared two similar ultrabudget PCs, the Compaq **Presario 4000** and the EMachines **T1150**. Both systems performed basic tasks very well, and one system provided excellent overall value.

Each of these shipping systems comes equipped with a 1.3-GHz Celeron processor, 128MB of RAM, and Windows XP Home Edition. Both can comfortably handle Internet access, word processing, and most other everyday com-

puting duties. The Presario 4000 scored 89 on PC World-Bench 4, outperforming the T1150 (which scored 87) by 2 percent. Both scores weren't too far below those of some more-expensive systems using Pentium 4 processors.

But like most very inexpensive PCs, the Presario 4000 and the T1150 forgo a full-featured graphics card for less-expensive, integrated graphics chips that use regular system memory. As a result, fast-moving games and other graphics-intensive programs are best left to a more powerful (and more expensive) PC.

Both systems also exhibit similar style; their minitower cases and monitors are charcoal black with matte silver

trim. And each PC has four USB ports, including two ports conveniently located on the front of the case, which makes using USB peripherals easy. But the similarities in the two systems end there.

The \$833 EMachines T1150 delivers solid value, with a 40GB hard drive and a 24X/10X/40X CD-RW drive as standard equipment. Images on the T1150's optional 17-inch EView 17F Flat CRT monitor looked crisp and flicker-free at 1024 by 768 resolution with 24-bit color. (A \$175 rebate good through July 31 drops the system's total price down to \$658.)



THE COMPAQ Presario 4000's hard drive is only 20GB.

It's a snap to add extra cards and drives; for such a small case, you get unusually easy access to the T1150's two free PCI slots and its external drive bay. And the chassis holding the hard drives is rotated to face the user, which facilitates installation as well.

In contrast, the \$749 version of the Presario 4000 that we tested came with a 15-inch Compaq 5500 CRT display, a 20GB hard drive, and a less-

versatile 48X CD-ROM drive.

On the positive side, the Presario 4000 has a sturdier keyboard than the T1150 and comes with an AGP port for adding a graphics card, an option unavailable with the EMachines PC.

The T1150's Achilles' heel could be service; EMachines received an Unacceptable rating for service in *PC World's* 2001 Reliability and Service Survey (go to [find.pcworld.com/28521](http://find.pcworld.com/28521)). Compaq earned a slightly better rating of Poor. But EMachines says it has recently made concerted efforts to improve its customer service, including extending the length of time it provides technical support from only 15 days to up to one year. Meanwhile, in the same survey,

EMachines earned a rating of Good in reliability, which bested Compaq's Fair rating.

So is it worth it for you to pay extra for Compaq's name? Hewlett-Packard seems to think so (and says the Presario line should be around for a while). But I'll stick with the better value every time.

—Kirk Steers ►

### Presario 4000

Compaq

★★★☆☆

Compaq's least-expensive desktop is still a bit pricey for buyers on a tight budget.

List: \$749

[find.pcworld.com/28181](http://find.pcworld.com/28181)

### T1150

EMachines

★★★★☆

The T1150 offers lots of features at a good price that gets even better with a \$175 rebate.

List: \$833

[find.pcworld.com/28182](http://find.pcworld.com/28182)

See the new Aluminum Mid-Tower Case, Turbo-Cool® 475, and SleekLine® 2400 P4 System at [pcpowercooling.com](http://pcpowercooling.com)

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John Dvorak

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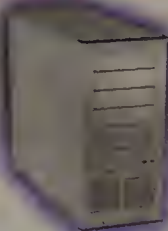
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## ENCLOSURES

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ALUMINUM MID-TOWER CASE

### HEAVY-DUTY FULL-TOWER



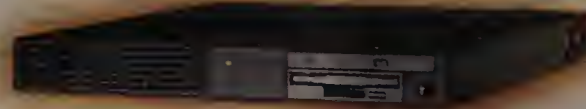
Distinctive style, heavy-duty construction, full-size M/B compatible, 10 bays, extra cooling and EMI suppression. You can't beat our all-steel, USA-made full-tower cases! Std. beige or deluxe version with casters, bold black finish, and a bright chrome bezel.

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The feature-rich SleekLine® 2.4GHz Pentium 4 System packs more power in less space than any other desktop computer. Beats PC World's Top 15 PCs!



### PERFORMANCE COMPARISON

| COMPUTER          | SIZE (cu. in.) | PERFORMANCE <sup>1</sup> |
|-------------------|----------------|--------------------------|
| SleekLine® 2400   | 565            | 129                      |
| Dell™ 8200 (2GHz) | 2087           | 119                      |

<sup>1</sup> PC WorldBench 4 score running Windows 2000 (higher no. is better).

The SleekLine 2400 comes with 256MB RAM, 120GB HD, DVD/CD-RW combo, 10/100 E-net, high-res. 3D video, and versatile, space-saving, USA-made case that can be desk-bottom mounted, stacked, or carried!

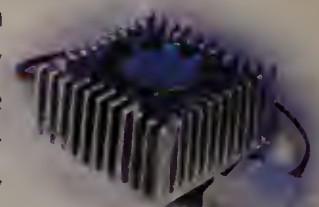
SLEEKLINE 1000 (1GHz Pentium III)

SLEEKLINE 2400 (2.4GHz Pentium 4)

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CPU-COOL 1U (Pentium III, FC-PGA, 1U)  
CPU-COOL 478 (Pentium 4, Skt 478)  
DUAL CPU-COOL X2 (Xeon, Slot 2, redundant)  
DUAL CPU-COOL P4 (P4, Skt 423, redundant)



### AMD®

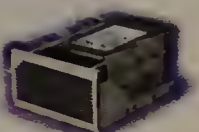
CPU-COOL Z1-H (K6-2, K6-3)  
CPU-COOL AG (Athlon/XP/MP)

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# Lights, Webcam, Action

## VIDEO SOFTWARE

A DECENT Webcam, a green backdrop, and Serious Magic's new **Visual Communicator** software: Those tools—plus a little practice—are all you need to turn a garden-variety PC into a remarkably potent

video production machine. The slick videos you can create will add multimedia zing to everything from business chalk talks to virtual reunions.

Part presentation package, part video capture/editing utility, part sheer technical inno-

vation, **Visual Communicator** (\$100) fairly bursts at the seams with features. Its TV prompter-style window cues you through prepared text; the profusion of glossy templates, text overlays, and transitional effects wouldn't look out of place on CNN. Most intriguing, its V-Screen option digitally replaces a green backdrop on the fly, letting you plunk yourself in front of the White House or any other scene you choose. You can improvise the required backdrop or opt for the \$150 Plus edition, which includes the green backing and a lapel microphone.

With a maximum display resolution of 640 by 480, the videos that this software produces (in Windows Media or AVI format) are primarily tailored for distribution via e-mail, the Web, or a local-area network. A reasonably mod-

## Visual Communicator

Serious Magic

★★★★☆

Exceptionally innovative video presentation software.

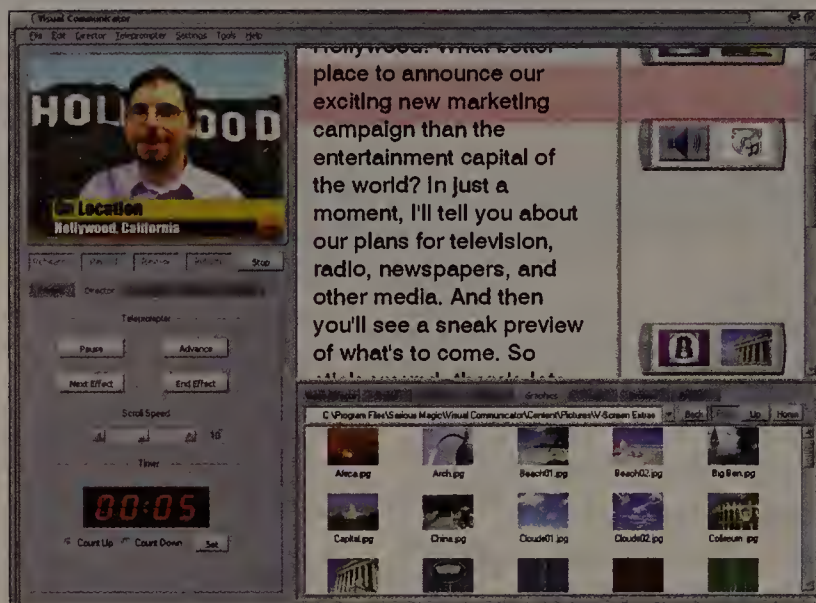
List: \$100 (Standard edition)

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ern computer is a must—at medium quality, my 700-MHz Pentium III machine chugged away for about 2 minutes to process each minute of video.

Ultimately, **Visual Communicator** isn't as effortless as its drag-and-drop interface suggests: I spent lots of time with my shipping program's online manual, and my lighting and Webcam required frequent tweaking. While not a complete no-brainer, the program is both useful and enormously entertaining—and the closest most of us will ever get to commandeering a TV studio.

—Harry McCracken



VISUAL COMMUNICATOR: Slick shows, pseudo-backgrounds.

# Iomega's New PC Storage

## STORAGE

ARE TOO MANY MP3s and digital photographs crowding your PC's hard disk? Want to back up copious amounts of data onto a no-hassle removable device? External storage could solve your problems. In its first foray into the hard disk drive category, Iomega steps in with one portable and one desktop entry.

I found a lot to like about the **HDD 30GB USB 2.0 Portable Hard Drive**. The sleek \$260 shipping unit (also available in a 20GB size for \$200), with easy plug-and-play installation, measures about 5.75 inches long—including the 1.5-inch-long USB 2.0 adapter module. The design provides added flexibility, since you can swap out this module for an

optional IEEE 1394 module. In my informal tests using the USB 2.0 version, the drive took approximately 75 seconds to write 650MB of data, which is about 2 minutes faster than an external 40X CD-RW drive takes to do it.

In addition, the HDD Portable ships with both Iomega QuikSync and Iomega Backup software—which makes this external drive especially attractive, since most competing models don't ship with backup software.

I also looked at a preproduction version of the **HDD 120GB USB 2.0 External Hard Drive** (smaller sizes are available as well). The \$350 External Hard Drive is larger and heavier



IOmega's Portable Hard Drive.

than the Iomega HDD Portable, and I give it low marks for its bulky, cumbersome wires, which include a 4-inch-long inline power adapter with a five-pin power connector. Still, this drive's performance was definitely comparable to the portable Iomega's, so consider it if you don't often need to move it from your desk.

—Melissa J. Perenson ►

## HDD 30GB USB 2.0 Portable Hard Drive

Iomega

★★★★☆

Iomega's svelte drive includes backup software, making it a great value for the price.

List: \$260

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## HDD 120GB USB 2.0 External Hard Drive

Iomega

(Preproduction unit, not rated)

Has a smaller design than competing external hard disks, but be prepared for bulky wires.

List: \$350

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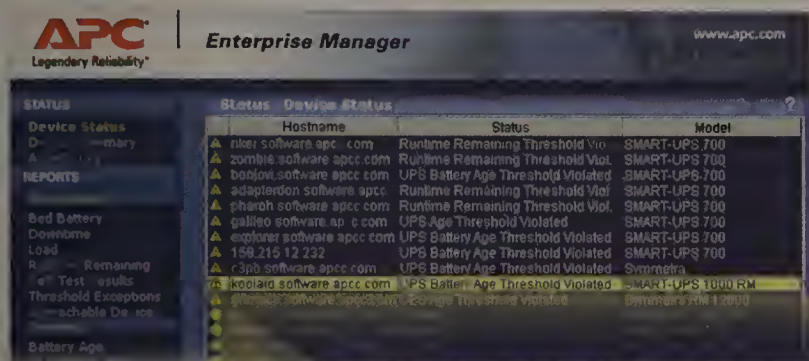
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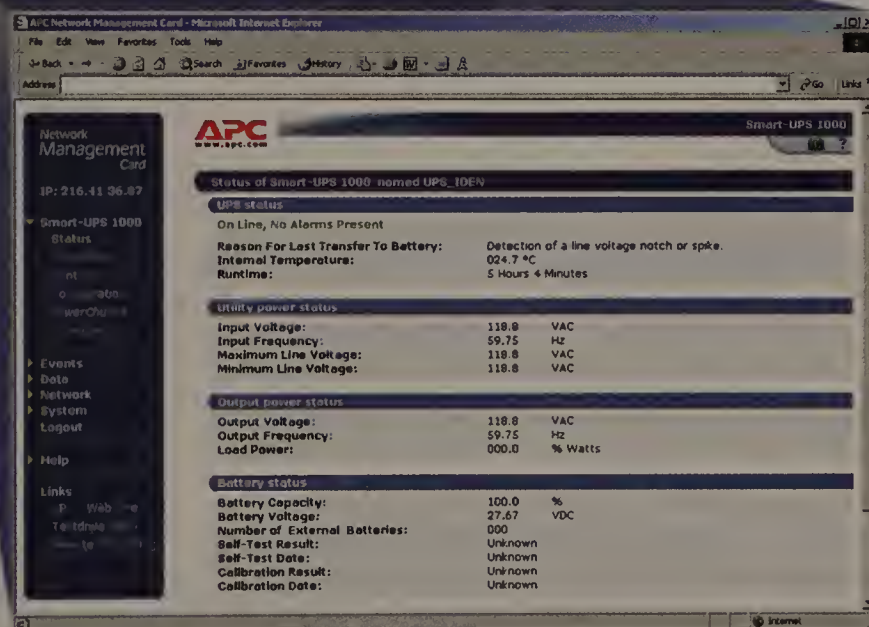
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# There's a Lot to Leica Here

## DIGITAL CAMERA

AMONG FILM-CAMERA buffs, the name Leica resonates as much as Rolls-Royce does in automotive circles. The 3.9-megapixel **Digilux 1**, the prestigious camera maker's latest digital model, has several at-

tributes in common with that luxury automaker's products: It's large, it's built like a safe, and it's costlier than competitors with lesser pedigrees.

But note that this \$895 camera isn't all Leica. It's actually the result of the first collaboration between Leica and Panasonic (Leica had worked with Fujifilm earlier). The unit's boxy body is bigger than at least a few full-size 35mm film cameras, and it has a collapsible, removable hood

to shield the LCD screen from sunlight (it would not have looked out of place in 1956).

In my hands-on testing of a preproduction model, I got elegant-looking images that were very sharp, with a wide range of contrast. The Digilux 1 can snap off photographs very quickly—as rapidly as any digital camera I've seen. It has several shooting modes, including the ones you'd expect (aperture priority, shutter priority, and full manual), although you might also want to stop down the aperture to something smaller than the unit's minimum f8 setting.

The camera is nearly useless in dim settings, because it has no infrared emitter or lamp to aid in focusing. The 2.5-inch LCD screen is much larger

than average; but the hood, when attached, obstructs the display's best angle of view. And because the Digilux 1 has no exposure lock, you must resort to full-manual mode to maintain a consistent exposure over multiple images.

The Digilux 1 is impressive, and its brand name may justify the premium price. But I would like it better if Leica had included a few more common options—such as an exposure lock and a focusing aid.

—Alan Stafford



THE BOXY Leica Digilux 1 has a retro look.

## Digilux 1

Leica

(Preproduction unit, not rated)

High-quality camera omits some features expected at this price.

List: \$895

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# An Office Without Windows

## LINUX SOFTWARE

ARE YOU itching to try Linux but unwilling to leave Microsoft Office behind? Check out **CrossOver Office** from CodeWeavers. This software allows users of the Linux operating system to run the 97 and 2000 (but not Office XP) editions of Word, Excel, PowerPoint, and Outlook—and Lotus Notes 5, as well. CrossOver Office enabled me to write this review using Word 2000 on a PC running Mandrake Linux.

Installing my shipping version of CrossOver Office soft-

ware began with a wizardlike setup routine. After a few clicks, CrossOver asked me for my Microsoft Office CD-ROM (purchased separately); Microsoft Office Setup appeared shortly thereafter, wanting a CD key. The installation then proceeded as it would have under Windows, but when Setup asked me to reboot, CrossOver intervened with a reminder that this sort of foolishness is not necessary in Linux. In no time, Microsoft Office appeared in my Linux start menu.

I found Lotus Notes similarly painless to set up. CrossOver can help install Microsoft TrueType fonts, too, and I used its "Add Other"

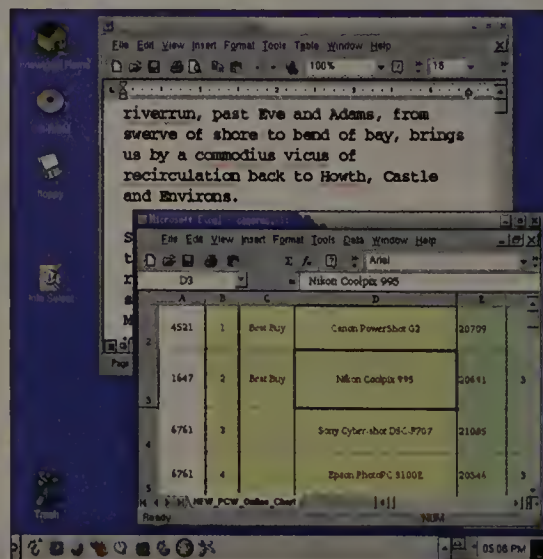
feature to load my Windows PIM of choice, InfoSelect. (CrossOver is built atop the Wine open-source project, which enables Windows applications on Unix operating systems. At present, CrossOver officially supports only Notes and Office, but check out [www.winehq.com](http://www.winehq.com) to see whether your favorite Windows tool might work with it.)

I tested CrossOver Office on both the Lycoris Desktop/LX and Mandrake Linux distributions. On Desktop/LX, CrossOver had difficulty locating the CD-ROM drive, and Office fonts were a bit mangled, but the applications were usable. On Mandrake, Office looked and behaved almost exactly as it does under Windows. There were minor display oddities,

but that's par for the course with Wine and hardly a disruption.

Office suites that are native to Linux (such as OpenOffice.org) continue to mature, but for some users, there is just no substitute for Microsoft Office. With CrossOver Office, you don't have to leave your Word and Excel behind if you're ready to work without Windows.

—Matthew Newton ►



I WANT MY Microsoft Office! With CrossOver Office, Linux PCs can run Word and Excel.

## CrossOver Office

CodeWeavers

★★★★☆

Finally, Linux-based PCs can run Microsoft Office software.

List: \$65 retail, \$55 download  
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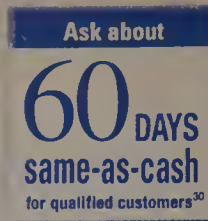
But it's nice to have options.





If ultra-thin and ultra-light are your business objectives, check out the **NEW Dell Latitude X200**. Only 2.8 lbs.<sup>4</sup> and 0.8" thin, it's powered by a new Ultra Low Voltage Mobile Intel® Pentium® III Processor-M at 800MHz and a high capacity lithium ion battery that gives you over five hours of power. Looking for something more? The Latitude C400 is a lightweight powerhouse that weighs only 3.6 lbs.<sup>9</sup> and stands merely an inch thin. It comes

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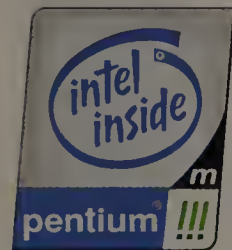
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# Powerful PC File Manager

## UTILITY

ONTRACK DATA International's PowerDesk Pro, long the best tool for managing PC files, now adds impressive features to version 5, beating back a strong challenge from Microsoft Windows Explorer.

My shipping **PowerDesk Pro 5** also matched functions included in Windows XP, such as group file renaming and thumbnail image views. But most of this software's new tricks are original: For example, you can search or sort MP3 files by album, title, artist, or genre, and you can edit

tags and create and manage playlists. Windows XP offers direct connection to many of the newer digital cameras, but PowerDesk Pro 5 lets owners of older Canon, Kodak, and Olympus models connect.

The features that originally put PowerDesk on the map are still there: great file viewers; an easy way to copy and move files to folders that are not currently visible on screen; integrated FTP (file transfer protocol) support for uploading and downloading files over the Internet; and built-in support for .zip files.

It's easier to manipulate files if you know something about them, and PowerDesk Pro 5 puts key information at your fingertips. You can edit and view notes on any file, and display file information in a details-view column. Best of all, when you point to a file, the new FileTips feature pops up a box of pertinent data. It would have been nice, though,

if Ontrack had allowed users to set the length of the delay before FileTips pops up.

A separate program, Dialog Helper, adds PowerDesk's file viewer, along with lists of recent files and folders, to many (but not all) of your applications' open and save dialog boxes. Some application dialog boxes aren't entirely compatible. For instance, Dialog Helper can add only files and folders lists to dialog boxes in Microsoft Office.

A third-party file manager is not a necessity. But for \$33 (\$30 by download), PowerDesk Pro 5 gives you a great deal of convenience.

—Lincoln Spector

### PowerDesk Pro 5

Ontrack Data International

★★★★★

Long-awaited upgrade makes this app once again the ultimate tool for managing PC files.

List: \$33 retail, \$30 download

[find.pcworld.com/27941](http://find.pcworld.com/27941)



TYPEAWAY

## PDA ACCESSORIES

WHEN PC USERS trained on keyboard and mouse move to a stylus-controlled PDA, their first reaction usually is: "This is great, but it would be better with a keyboard." Unfortunately, since a PDA is meant

to be a pocket-size information system, adding a keyboard requires that you cart around a major encumbrance.

Logitech tries to transcend this problem with its cleverly designed **KeyCase**, a 5-ounce, wraparound PDA case that integrates a full-size keyboard right into its cushiony fabric.

After trying out a shipping version of the \$100 KeyCase with my Palm M515, I can say

it is a close-but-no-cigar concept. To use this device properly, you must find a flat surface to place it on, and it takes some time to feel comfortable typing on the mushy fabric surface. True, Logitech has engineered the keyboard and its accompanying software so you can do 99 percent of your PDA input without ever taking your hands off the keyboard to use the stylus, but I found the overall experience frustrating.

However, Logitech has also released the thin, stylish **Type-Away** keyboard (\$80), which does work very well. Its Palm-size clamshell case opens to display a touch-type-friendly keyboard that contains all the stylus-workaround features included on the KeyCase. The shipping Type-Away I road-tested was a joy to type on—it had the feel, but

not the size, of a desktop computer's keyboard. I particularly liked the dedicated function keys—they permitted me to keep my hands on the keyboard and not on the stylus when selecting a screen task.

Both keyboards work with all Palm M-series and I-series devices. The flexible KeyCase has ergonomic flaws, but the aluminum-cased TypeAway is a pure functional winner.

—Michael S. Lasky ►

### KeyCase

Logitech

★★★☆☆

Combo keyboard/wraparound PDA case is difficult to use.

List: \$100

[find.pcworld.com/27701](http://find.pcworld.com/27701)

### TypeAway

Logitech

★★★★★

This folding PDA keyboard is a well-designed winner.

List: \$80

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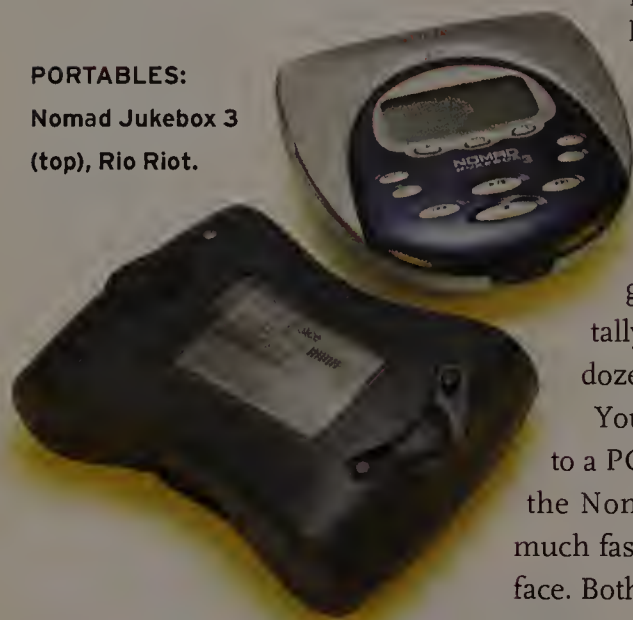
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# Get a Grip on Digital Music

## MP3 JUKEBOXES

WANT TO PUT your entire digital music collection on a huge-capacity device smaller than a paperback novel? Look into Creative Labs' **Nomad Jukebox 3** and Sonicblue's **Rio Riot**.

**PORTABLES:**  
**Nomad Jukebox 3**  
(top), **Rio Riot**.



Each packs a 20GB, notebook-style hard drive; delivers rich, powerful sound; is mobile; and sells for about \$400.

Despite being a little bulky for most pockets, the Rio Riot emphasizes portability:

Its hourglass figure is easy to grip. The larger Nomad is shaped like a traditional CD player and is difficult to grab without accidentally pressing one of its dozen buttons.

You hook either player to a PC via a USB 1.1 port; the Nomad also includes a much faster IEEE 1394 interface. Both players let you nav-

igate through menu options and copious music lists via handy scroll wheels. And both play MP3 and Windows Media Audio files. The Nomad also plays WAV files and has a combination line-in/optical-in port that allows you to encode all three formats without a PC connection. Only the Rio Riot, however, allows you to manually adjust equalizer levels. Accompanying both shipping units are rechargeable lithium-ion batteries and an adequate set of headphones.

Although the players were handy, both had glitches. I was able to fix the Nomad's repeated crashes by resetting it or by removing and reinstalling its battery. The Rio Riot suffered from similar—though less frequent—lock-

ups, which resetting solved.

Choose the Rio Riot to have lots of music on the go. But if you want a stereo component that's truly mobile, I'd recommend the Nomad Jukebox 3 for its additional features.

—Seán Captain

## Nomad Jukebox 3

Creative Labs

★★★★☆

Lots of home stereo features in a fairly portable package.

List: \$400

[find.pcworld.com/27761](http://find.pcworld.com/27761)

## Rio Riot

Sonicblue

★★★★☆

Better portability but fewer features than the Nomad.

List: \$400

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*"Mission Critical" shouldn't refer to your tech budget.*



Monitors



Wireless Routers

# Move Your Net Files Faster

## UTILITY

DO YOU NEED a special file transfer protocol program? After all, you can use a Web browser to download a graphics driver or a tax form from

the Internet. But browsers are not the best tools for uploading files to an Internet server, and an FTP program can be useful if you're maintaining a Web site or sharing huge files.

FTPing a large file to the Internet for a coworker to download is faster and more efficient than e-mailing it.

As its very nerdy name implies, Ipswitch's WS\_FTP software originally targeted the technically inclined. But improvements to the user interface make the compa-

ny's just-released **WS\_FTP Pro 7.5** (available for \$45 retail and \$40 by download) accessible to most Windows users.

My shipping copy of WS\_FTP Pro 7.5 included plenty of serious tools for users who transfer a lot of data. For instance, it allowed me to keep two folders synchronized over the Internet—a real convenience if your Web site has so many files that you can't keep track of them all. There's also a scheduler, a scripting tool to automate regular FTP tasks, and SSL encryption to ensure that no one except the intended recipient reads your files.

Ipswitch worked to make WS\_FTP Pro easier to use. A Site Profile Wizard makes setting up new sites a breeze. And a new set of help files,

## WS\_FTP Pro 7.5

Ipswitch

★★★★☆

Great—if you need it—for heavy-duty, Net file transfers.

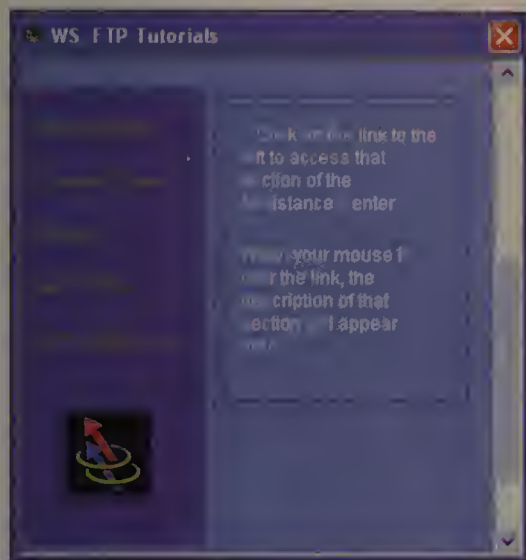
List: \$45 retail, \$40 download

[find.pcworld.com/27961](http://find.pcworld.com/27961)

dubbed "The Assistance Center," offers basic-job tutorials. Although you can now upload a file directly from Windows Explorer, this operation isn't as easy as it looks. And script writing and setting up SSL encryption remain tasks for the technically savvy only.

Most users don't need this level of functionality—and shouldn't pay for it. Many free but less feature-rich FTP programs are available, including the original basic WS\_FTP.

—Lincoln Spector ■



NEW: HOW-TO tutorials in WS\_FTP Pro 7.5.

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# That Works For Me

Road warriors speak out about the technologies that make them productive



**D**elayed flights and bumper-to-bumper traffic got you down?

Mobile business professionals and commuters spend much of their time fuming over airport delays and white-knuckling their way through stalled commuter traffic. On-time records for major airlines have shown little improvement this past year, according to the U.S. Department of Transportation. And urban traffic congestion, the DOT reports, cost the U.S. \$78 billion in wasted fuel and lost time.

Fortunately, high-tech companies are rushing to the aid of stranded and strung-out workers, and savvy managers are embracing new alternatives to the traditional commuters' workplace.

"Management is changing its views about telecommuting," says Phil Montero, founder and president of YouCanWorkFromAnywhere.com, a Web site for remote workers and their managers. "Many are realizing that their employees are more productive, and work faster, from a home office."

## HOME IS WHERE THE EMPLOYEE IS

Montero also works directly with law firms, commercial real estate developers, and other companies, setting up home and mobile offices. Although his clients often worry that their remote workers will spend more time slacking off on sun decks than hammering away at their computer keyboards, he insists that with training and the right technology, managers can hold their people accountable at home as well as at the office.

Workers can use the telephone, email, and instant messaging to keep in constant touch, Montero suggests. "Instant messaging is a very powerful business tool," he notes. "Yet many users still have trouble seeing IM as something other than a toy for chatting with their buddies."

Mobile professionals are often the first to test the latest digital devices, software, and services. They are constantly seeking the lightest, most powerful tools to take on the road.

One of Montero's customers, a corporate real es-

*Continued on page 3*

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**BenQ**

*Enjoyment Matters*

*Continued from page 1*  
tate developer, asked Montero to make its execs more productive on the road.

"These people are among the most mobile I've worked with," Montero says. "They require wireless Internet access while spec'ing out properties. They want one executive to be able to work on his laptop while another is driving."

Montero often sets up virtual private networks (VPNs) that his clients can use to access their companies' servers through phone lines and broadband connections at home offices, hotels, and conference centers. However, he had the real estate developer subscribe to Net access via wireless telephone service providers. "I believe in traveling light," he explains. "And when you've got your cell phone connected to your laptop, that's enough to check, send, and receive e-mail."

Montero himself is a light traveler: he regularly travels to corporate headquarters nationwide with little more than his handheld PC. He does, however, carry a portable full-size keyboard, which he uses to type out long documents on the handheld. And Montero carries extra memory cards to store e-books and other large data files.

Mobile professionals often think they must sacrifice productivity in order to make traveling easier. But some high-tech manufacturers, especially projector makers Benq Inc., Mitsubishi Digital Electronics America Inc., and ViewSonic Corp., are engineering powerful products that are fit for the road.

### **BENQ: QUALITY WITHOUT WEIGHT**

Today's mobile professionals want to travel light. But they also want to be heavy on the quality and excellence of the projectors they take with them. That's why the SL705X portable projector from Benq Inc. ([www.benq.com](http://www.benq.com)) is an ideal projector for business-critical sales presentations, training seminars, and other applications.

Based on DLP projection technology that assures razor-sharp clarity and brilliance, Benq's SL705X



**Benq's SL705X portable projector: razor-sharp clarity and brilliance, at only three pounds**

weighs in at three pounds and is so sleekly designed that it will fit into a compact case along with a notebook computer.

But what really separates the SL705X from the pack are the key features that make life more productive for today's mobile professionals. For example, from a distance of only 6.5 feet—half the size of a typical conference-room table—the SL705X can project an image five feet wide or deep. The remote

control for this imaginative projector is the size of a business card. Despite its small size, the controller offers several function buttons, including freeze, zoom, and mute, to give the presenter complete control of the presentation from any spot in the room.

And the SL705X features a crisp XGA resolution of 1024 x 768 while producing a sparkling 1000 ANSI lumens. Benq stands by its SL705X with a three-year warranty that includes a 72-hour replacement guarantee the first year.



**Mitsubishi's XD200 boasts ColorView technology with sRGB, the Microsoft color standard.**

### **MITSUBISHI: COLORVIEW MEETS THE STANDARD**

Another leading manufacturer, Mitsubishi Digital Electronics America Inc. ([www.mitsubishi-presentations.com](http://www.mitsubishi-presentations.com)), is packing heavyweight display quality into a highly innovative, portable, and easy-to-manage package. The XD200 ColorView stands out as the first DLP projector to combine Mitsubishi's proprietary ColorView technology with sRGB, the Microsoft

*Continued on page 5*

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*Continued from page 3*  
color standard.

The 6.6-lb. XD200 produces bright, sharp images. It boasts 1024 x 768 XGA resolution and a lamp that glows brilliantly at 2000 ANSI lumens of brightness. The ColorView technology that lies at the center of the projector provides an independent color control function on six axes (red, blue, green, cyan, magenta, and yellow) and manipulates color by using a sophisticated graphic arts function. If a user wants to add red into an image, for example, he simply moves a toggle bar, and the projector adds red instantly; no other color in the color wheel is affected.

The sRGB color standard in the XD200 ColorView, meanwhile, allows presenters to match their displays without a complicated calibration process; the user simply selects the same sRGB profile on both the computer and the projector to create colorful presentations.

Mitsubishi backs the XD200 ColorView with a three-year warranty on parts and labor and a 90-day warranty on the projector's lamp. The XD200 ColorView also comes with a global emergency roadside assistance program, which replaces units under warranty the next business day wherever possible.



**ViewSonic Corp.'s PJ750 projector is HDTV ready and compatible with multiple PC or Mac computer inputs.**

#### **VIEWSONIC: FULL OF FEATURES**

ViewSonic Corp.'s first-class portable XGA projector, the PJ750, is ideal for conference rooms, boardrooms, and lecture halls. The PJ750 ensures clear, crisp images in a variety of presentation settings, with 2,200 lumens of brightness, 1024 x 768 resolution, and high contrast of 500:1.

Users of the PJ750 will find this full-featured projector's controls straightforward and intuitive. And



the PJ750 offers zoom and digital keystone correction as well as multiple computer and video inputs and outputs for greater flexibility.

The PJ750's short focal length, zoom functions, and digital keystone correction guarantee versatility in virtually any setting. And the projector is HDTV ready—supporting HDTV signals including 480i, 480p, 1080i, and 720p. The projector also includes one-touch setup for fast, easy sync, sharp focus controls, and compatibility with multiple PC or Mac computer inputs.

The PJ750's "eco-mode" extends lamp life and contributes to whisper-quiet noise levels. And at only 7 pounds and 11.7 x 9.0 x 3.0 inches, the projector slips quite easily into an optional carrying case.

ViewSonic is now offering PJ750 owners a one-year limited warranty for its projector lamps—much longer than the existing industry standard of 90 days. And ViewSonic's three-year warranty, along with one full year of its Express Exchange service, comes standard with the PJ750 at no additional charge.

#### **LOG ON FROM ANYWHERE**

The mobile professional must have a high-quality projector, but he or she can leave much of the other hardware behind.

YouCanWorkFromAnywhere.com's Phil Montero, instead of lugging his laptop around with him, will log on to a service that allows access to his home office computer via the World Wide Web. "The service I use lets me work on my home PC anywhere, from any Web browser, without any proprietary software at the remote location," Montero says.

Alternatively, a laptop-bearing mobile professional waiting for his flight, or for his next meeting, can access the Net at a business center or even, in some cities, a coffee shop. Airport business centers provide wireless and T-1 Internet access, as well as phone, fax, and copy services. Some coffee shops combine wi-fi Internet access with that other essential business tool—caffeine.

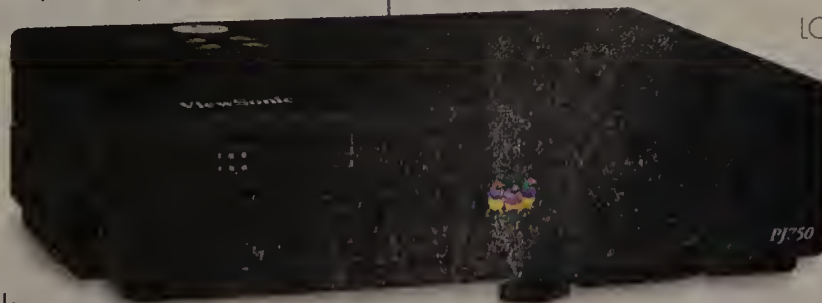
"It all depends on what your specific travel needs are," Montero says. "Once you know what those are, you can find the tools and training you'll need to do anything, from any location."



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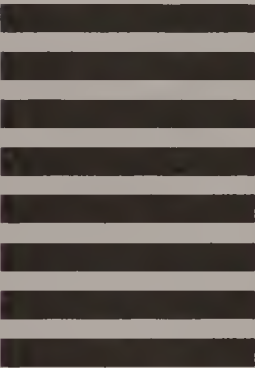
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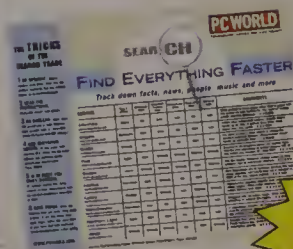
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This year, our editors once again met to debate the merits of the hundreds of products we've evaluated in the past 12 months. Our choices embody the best mix of performance, value, consistency, and innovation—from perennial favorites like Dell's Dimension line to upstarts like Lavasoft's Ad-aware. We also looked farther backward and hammered out a list of All-Time World Class Awards—the five most significant PC products in history. So take your seats, and enjoy our salute to the best of the best. ►

BY THE EDITORS OF PC WORLD | PHOTOGRAPHS BY MICHAL VENERA

# Best Computers



**Computer Product of the Year**  
**AMD ATHLON XP** With the October 2001 launch of Athlon XP, a revved-up version of its original Athlon processor, AMD has once again offered

PC buyers a powerful, economical alternative to Intel's Pentium franchise.

Athlon XP-based systems have proved the chip's mettle in *PC World's* PC World-Bench 4 tests, consistently outperforming Pentium 4-based PCs that run at higher clock speeds. And despite Intel's aggressive price cuts on P4, systems based on Athlon XP continue to sell for less.

The Athlon XP builds on the success of



its predecessors via some notable architectural improvements. By ratcheting down the chip's power requirements, AMD cleared the way for speed increases to boost performance. And the chip's new 3DNow Professional instruction set means better performance in optimized applications and compatibility with Intel's

SSE multimedia and 3D instructions.

Despite significant improvements and strong reviews, Athlon XP's ride hasn't been entirely smooth. You can't buy Athlon systems from top vendors like Dell and Gateway, and AMD's use of "performance ratings" (benchmark numbers that suggest performance in comparison to nonexistent versions of the older Athlon) rankles some critics, who oppose labeling a 1.53-GHz chip as an 1800+.

That said, AMD plans to introduce even faster chips. By the time you read this, AMD expects to be shipping a new Athlon XP processor based on a .13-micron manufacturing process (current chips are based on a .18-micron process).

The new process will lead to smaller CPUs, speeding performance inside the chip and further reducing power consumption to permit even higher clock

## The All-Time World Class Awards



FOR OUR 20TH AWARDS, we gave ourselves a daunting task: to review the hundreds of World Class Award winners and name the top five winners of all time.

After careful study, we present our roster of a quintet of products whose excellence, innovation, or influence—or a combination of all three—earn them special places of honor in the annals of PC history:

### 1984

**ONLINE PIONEER:** Hayes's \$700 SmartModem 1200.

**HAYES SMARTMODEM 1200** Early PC telecommunications trickled along at 300 bits per second—which meant that you could read faster than text appeared on screen. Then our 1984 winner for Best Modem, the \$700 Hayes SmartModem 1200, came along and quadrupled the speed of online access and downloads. The following year, the \$549 Hayes SmartModem 2400 would leave the 1200 in its dust, but together with CompuServe (selected as the Best Online Service in 1984), the SmartModem 1200 set the standard for online computing years before the Web came along.

**COMPAQ DESKPRO 386/40** The 1987 World Class winner for Best Desktop Computer, the \$4500 Compaq Deskpro 386/40, was the first PC powered by Intel's 80386 processor, the first 32-bit chip in the 8088 series. The 386 chip permitted multitasking—

making Microsoft's then-unpopular Windows newly practical—and it still ran must-have DOS applications such as WordPerfect, Lotus 1-2-3, and Harvard Graphics. The fact that Compaq was the first to market with a 386 system was revolutionary as well, because it meant someone had beaten IBM at its own game for the first time.

**NEC MULTISPIN 84** We didn't have a World Class award category for CD-ROM drives until 1993, but from then on they changed the way PCs were used, helping them become more versatile, opening them to a wide array of multimedia and other applications not previously possible, and eventually becoming the preferred method of software distribution. This first winner, a 2X drive that cost \$500 and up, signaled a new chapter in sound- and vision-enhanced computing that affects all of us to this day.

**WINDOWS 3.11** Many versions of Windows—from 3.0 to XP—got more hype, but the better products have always been the low-key, debugged versions that arrive between the biggies. The 1994 Best Operating System, Windows 3.11 for Workgroups, was that kind of release—a stable, quick, compatible OS that introduced built-in networking to the Windows environment. It's hardly surprising that a lot of folks continued to contentedly run Windows 3.11 even after Microsoft rolled out Windows 95 a year later.

**NETSCAPE 2.0** Netscape 1.0 won a World Class award for Best Internet Interface/Utility in 1995, but 1996's more full-featured and robust version 2.0—with new and improved support for tables and images—first gave the Web a friendly, professional sheen and signaled the beginning of the browser wars. —Michael S. Lasky

speeds. And Intel, too, will roll out more-potent chips. But for now, the Athlon XP delivers today's most compelling blend of value and performance. [www.amd.com](http://www.amd.com)

#### Best Small-Business PC, Best Home PC

**DELL DIMENSION 8200** Dell's bread-and-butter Dimension lines are still among the best PCs around. Members of the 8200 series feature easy-open cases and enough processor and equipment options to let you assemble anything from a sub-\$1000 budget machine to a powerful multimedia workhorse. Sure, you can find cheaper PCs, but the Dimensions' record of consistently placing near the zenith of our Top 15 Office and Home PC charts is unmatched. Throw Dell's first-rate service and support into the equation, and you've got yourself a winner. [www.dell.com](http://www.dell.com)

#### Best Ultralight Notebook

**FUJITSU LIFEBOOK P-2000** The 1.6-inch-thick, 2.8-pound Fujitsu LifeBook P-2000 costs between \$1499 and \$1799 and packs a wealth of features, making it our pick for the best ultralight notebook. It has an IEEE 1394 port, an S-Video port, and a modular bay that can accommodate a DVD-ROM/CD-RW combination drive. Extra-long battery life (3.5 hours on one charge), helped by a power-saving Transmeta Crusoe processor, should easily satisfy any business traveler who needs to get work done on the go. An easy-to-use

## WORLD CLASS

# PRODUCT OF THE YEAR



### Google

A fast chip. A slick wireless gateway. A potent spyware zapper. An indispensable search engine. Four outstanding finalists competed to become our 2002 Product of the Year. And the winner—may we have the enve-

lope, please?—is Google. The

leading search engine keeps get-

ting more accurate and versatile while retaining its clean, efficient look; as Contributing

Editor Stephen Manes says, "It's gotten to the point

where you don't even think twice about typing a company's name into Google rather than the address bar, and when you need a quick answer, you Google." Small wonder, then, that many of our editor-judges call on it three, four, or more times a day.

keyboard and a bright 10.6-inch screen also help make this slim, silver marvel tantalizing even for die-hard desktop users. [www.fujitsupc.com](http://www.fujitsupc.com)

#### Best PDA

**SONY CLIÉ PNG PEG-NR70V** Packing a keyboard, a big and vibrant screen, an MP3 player, and a digital camera into a package the size of a conventional palmtop, the Clié PNG PEG-NR70V is the best new PDA we've seen this year. The screen is particularly impressive: It's bright and readable in all lighting conditions, and it flips over and twists like a camcorder screen. At \$599 this cutting-edge device is the most expensive Palm-based PDA

we've seen. But you get plenty of features for your money—and it looks damn cool. [www.sonymstyle.com/vaio/clie](http://www.sonymstyle.com/vaio/clie)

#### Best Corporate PC

**DELL OPTIPLEX GX 240** Dell's Open-Manage software and compact, tool-less cases yield an attractive package for business buyers. Solid reliability and service ratings don't hurt either. [www.dell.com](http://www.dell.com)

#### Best Notebook

**IBM THINKPAD A31P** This stellar notebook line includes options for everything from wireless networking to speedy Mobile Pentium 4 processors and Radeon 7800 graphics chips. [www.ibm.com](http://www.ibm.com) ►



Dell OptiPlex GX 240



IBM ThinkPad A31P



Fujitsu LifeBook P-2000

# Best Hardware



## Hardware Product of the Year, Best Networking Product

**LINKSYS BEFW11S4** Wireless networks came into their own this year, dropping in price and growing more reliable as

vendors ironed out Wi-Fi compatibility issues. Meanwhile, more computers and broadband connections reached our homes and home offices, making easy-setup networks more attractive than ever.

Fittingly, our hardware product of the year is our favorite wireless net centerpiece, Linksys's BEFW11S4. Last year,



this versatile \$180 gateway won our Best Home Networking award (back then it cost \$289). But with a Wi-Fi (802.11b) wireless access point, a cable/DSL router, and a four-port switch included, this gateway can support a broadband connection

for a small-office network. Good printed manuals walk you through the process of setting up the BEFW11S4 and getting all your connected PCs talking.

Wi-Fi's top speed of 11 mbps is enough for sharing a broadband connection and running a small network, though larger companies may want to consider more-expensive Wi-Fi5 (802.11a) networks, which promise 54-mbps speed.

The future's bright for wireless networks in homes and small offices. Non-PC products such as MP3 stereo components connect to networks. At work, products like Linksys's Wireless Presentation Gateway link an array of devices. Later this year, 802.11g networks will unite the speed of Wi-Fi5 with Wi-Fi compatibility; but for now, Wi-Fi networks are a great way to share a home or office broadband connection, and the BEFW11S4 is a good place to start. [www.linksys.com](http://www.linksys.com)

## Best Recordable-DVD Drive

**PIONEER DVR-A04** Rewritable-DVD drives stand poised to supplant CD-RW models, and they may replace your VCR as well, offering more-durable media and higher-quality video. Pioneer's DVR-A04 DVD-RW/R drive is a prime example: Its media can store up to 4.7GB of data—far more than a standard 650MB CD holds and enough for 2 hours of video. At \$499, the drive debuts at about half the initial cost of its well-liked DVR-A03 forerunner, with improved DVD-ROM and CD-ROM read speeds and the same write speeds. Moreover, its write-once DVD-R discs, cheaper than ever at about \$2 a pop, have proved highly compatible with legacy DVD-ROM drives and DVD movie players. The only caveat: Rewritable-DVD standards are not firm, and one of the major contenders, the DVD+RW Alliance, has slightly faster drives and its own write-once DVD+R media. [www.pioneerelectronics.com](http://www.pioneerelectronics.com)

## Best Graphics Board

**VISIONTEK XTASY GEFORCE4 TI 4400 A** year ago we named Microsoft's DirectX 8 our Most Promising Software Newcomer, but so far we haven't seen much more



Sonicblue ReplayTV 4000



Epson Stylus C80



ViewSonic VG171



Logitech Z-560

than promise. That's about to change with the release of stunning new games like Unreal Tournament 2003 that will push graphics cards and gaming rigs to their limits. Our graphics board pick is ready for the challenge, with 128MB of 550-MHz DDR memory and one of the fastest graphics chips available, NVidia's GeForce4 Ti 4400. This \$265 board has most

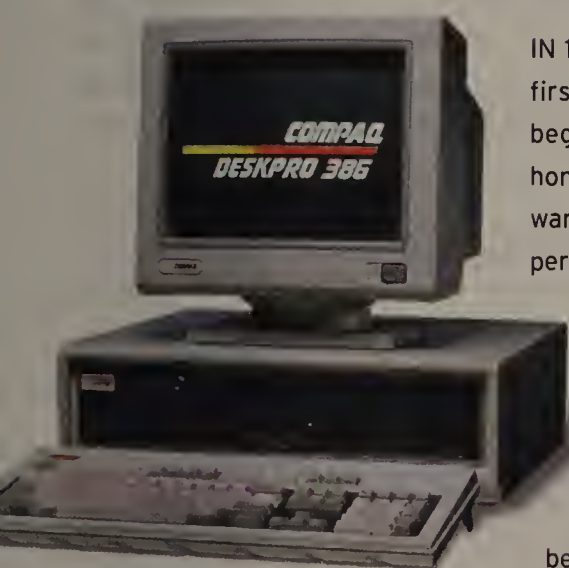
of the speed of pricier GeForce4 Ti 4600 boards that go for upward of \$100 more. [www.visiontek.com/retail.shtml](http://www.visiontek.com/retail.shtml)

### Best Digital Camera—\$500 or More

**CANON POWERSHOT G2** Canon's \$799 PowerShot G2 packs loads of manual and semiautomatic adjustments and focusing control into a reasonably priced package.

This 4-megapixel camera takes superb snapshots with sharp detail and realistic colors. The boxy G2 sports a 3X optical zoom (with a focal range of 35mm to 102mm, in 35mm equivalent) and a swiveling LCD that lets you point the screen up, down, or in the same direction as the lens—handy when you take self-portraits or when you use the included remote ►

## Looking Back at 20 Years of Winners



### 1987 COMPAQ DESKPRO 386:

First PC with Intel's 80386 chip.

**1983** What's this? The first World Class Awards, and there's no PC winner? That's because IBM is still the sole PC manufacturer. Its top-of-the-line model is a dual-floppy unit with 64KB of memory.

**1984** The \$5000 Compaq Plus Personal Computer wins in a new category, Best Compatible Computer. Keyboard-command-based WordStar (\$350) tops a crowded field of word processor competitors. The Microsoft Mouse is Best Input Device; it costs \$200.

**1985** The IBM PC AT is tapped as Best Desktop Computer. Priced at \$4090, the system comes loaded with 512KB of RAM. Years before the first Zip drive appears, Iomega's \$3995 Bernoulli Box is hailed for its 20MB storage capacity.

**1986** WordPerfect topples WordStar from the word processor summit. Microsoft Windows 1.0—a DOS add-on, not an operating system—wins for Best Application Integrator.

**1987** Compaq's Deskpro 386 rules the desktops (see page 84).

**1988** The Compaq Portable 386 Transportable PC, a desktop PC with handles, weighs in at 19 pounds while

IN 1983, DURING *PC World's* first year of publication, we began awarding World Class honors to hardware and software products for enhancing personal computing.

From 1983 to 1993, a readers poll selected the winners. That first year, just 14 "PC-compatible" products won awards. That number grew to a high of 220 in 1991 and now stands at a more manageable 66.

Here's a look at some milestones along the way.

Toshiba's \$2987 T3100/20 Laptop tips the scale at "a scant 20 lbs." Microsoft Excel is voted Most Promising Software Newcomer.

**1989** Compaq sweeps the Desktop, Laptop, and Transportable PC categories; Dell debuts in third with its System 325 desktop.

**1992** DOS-platform programs fade as Windows gains appeal: Excel ousts Borland's DOS-based Quattro Pro as Best Spreadsheet.

**1993** Multimedia hits the World Class Awards, as Creative Labs' 8-bit Sound Blaster Pro wins our first sound card award. Another newcomer: the best CD-ROM drive, NEC's 2X MultiSpin 84.

**1994** Intel's Pentium wins *PC World's* first Product of the Year award. Windows 3.11 for Workgroups takes OS honors (see page 84), while Microsoft Word begins its reign as Best Word Processor.

**1995** IBM OS/2 Warp 3.0 is the surprise Product of the Year. The first 32-bit OS beat Microsoft's Windows 95 to market and was hailed for its technological advance.

**1996** Windows 95 is named both Best Operating System and Loser of the Year, reflecting the love-hate relationship it engendered. Users applaud the OS's technological advances but note that it's dogged by bugs. Meanwhile, Netscape 2.0 captures Product of the Year honors (see page 84).

**1997** The PalmPilot, at \$400 for a 1MB system, wins Best PDA. Its rousing success helps wake up the moribund PDA market.

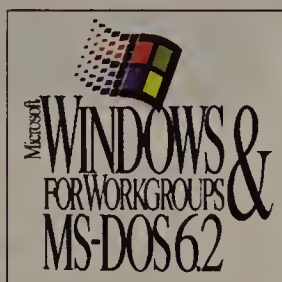
**1998** Intel's Pentium II earns Product of the Year honors, but the sub-\$1000 PC offered by multiple vendors—featuring lowly Pentium MMX CPUs—is named Most Promising Hardware Newcomer.

**1999** The Cheap PC (now available for as little as \$300) weighs in as Product of the Year. After a difficult 12 months, privacy is labeled Loser of the Year; everything from nosy Web sites to Intel's serial-numbered Pentium II intrudes on PC users' anonymity.

**2000** AMD's Athlon ends Intel's long run of chip supremacy and becomes Product of the Year.

**2001** The Plextor PlexWriter 16/10/40A, a \$247 CD-RW drive, is Product of the Year. Pioneer's \$995 DVR-A03 is the first winner in the new DVD-R drive category.

—Michael S. Lasky



### 1994 OS WINNER

Win 3.11 for Workgroups.



### 1996 PRODUCT OF THE YEAR

Netscape 2.0.



Logitech Cordless Freedom Optical



Canon PowerShot G2



iRiver America SlimX



VisionTek Xtasy GeForce4 Ti 4400

control. It offers long battery life, too: On one charge of its lithium ion battery, the G2 took 348 photos. [www.powershot.com](http://www.powershot.com)

### Best Digital Camera—Under \$500

**TOSHIBA PDR-M71** Good battery life, a sub-\$400 price, and 3.2 megapixels of resolution make the PDR-M71 an outstanding value. [www.dsc.toshiba.com](http://www.dsc.toshiba.com)

### Best Digital Audio Player

**IRIVER AMERICA SLIMX** There are lots of great contenders here, from Apple's iPod to Sonicblue's RioVolt SP250. But while the hard-drive-based iPod is pretty slick, its software support on PCs isn't. CD-based MP3 players like the RioVolt SP250 don't have that problem, but they can get pretty bulky. Enter iRiver's \$199 SlimX, which includes a high-quality FM tuner and cuts back on the bulk by moving its

four-line LCD screen onto a handy in-line remote. Only slightly wider than a CD and a scant 16.7mm thick, the SlimX leaves you plenty of room to stow extra MP3 CDs. [www.iriveramerica.com](http://www.iriveramerica.com)

### Best Gadget

**SONICBLUE REPLAYTV 4000** Personal video recorders aren't new, but they're changing the way we watch TV. Sonicblue's ReplayTV 4000 represents a natural evolution of PVR technology to capitalize on broadband connectivity. Available in 40GB, 80GB, 160GB, and 320GB capacities, this networked hard-disk-based recorder uses a broadband ethernet connection to download channel guide information, and to enable users of 4000-series recorders to send shows to one another via the Internet, albeit in a lengthy process. The ReplayTV 4000's main draw-

back is its price, which starts at a steep \$699 for the 40GB model. But unlike with TiVo, its better-known competitor, you don't have to pay additional fees to access the program guide. [www.sonicblue.com](http://www.sonicblue.com)

### Best Wireless Communication Device

**SAMSUNG I300** PDA/cell phone combos took steps in the right direction this year, from Handspring's Treo (integrated keyboard) to Kyocera's QCP 6035 Smartphone (sleeker design). For our money, the Palm-based Samsung I300 is the best of the new bunch. This \$500 hybrid uses its crisp color screen as a keypad, keeping the unit's size and weight down—the 6-ounce I300 isn't much larger than some Pocket PCs. [www.samsungusa.com](http://www.samsungusa.com)

### Best Input Device

**LOGITECH CORDLESS FREEDOM OPTICAL** Total PC control, sans wires, courtesy of this \$100 keyboard-and-mouse's many customizable buttons. [www.logitech.com](http://www.logitech.com)

### Best Hard Drive

**MAXTOR DIAMONDMAX D540X** Combining good speed and great value, Maxtor's D540X line of drives tops out at a staggering 160GB. [www.maxtor.com](http://www.maxtor.com)

### Best CD-RW Drive

**PLEXTOR PLEXWRITER 40/12/40A** New 40X drives let you burn a CD in about 3 minutes. Our pick, from always-reliable Plector, goes for \$189. [www.plector.com](http://www.plector.com)

### Best CRT Monitor

**VIEWSONIC GS790** With a depth of only 16.2 inches and a price of \$289, our top selection is short on everything but image quality. This 19-inch CRT is a great choice if you have a reasonable amount of desk space. [www.viewsonic.com](http://www.viewsonic.com)

### Best Flat-Panel Display

**VIEWSONIC VG171** For more-cramped quarters—or just for the elegant look—our LCD monitor winner, the 17-inch VG171 (priced at \$769), has outstanding all-around image quality and is only 6.6 inches deep. [www.viewsonic.com](http://www.viewsonic.com)

## Best Scanner

**EPSON PERFECTION 1650 PHOTO** For photo or film scanning, Epson's \$249 Perfection 1650 Photo captures beautiful images at resolutions up to 1600 by 3200 dpi and in 48-bit color. [www.epson.com](http://www.epson.com)

## Best Sound Card

**CREATIVE LABS SOUND BLASTER AUDIGY PLATINUM** Creative Labs ratcheted up PC sound quality with its Audigy line. The included IEEE 1394 port is icing on the cake. [www.soundblaster.com](http://www.soundblaster.com)

## Best PC Speaker System

**LOGITECH Z-560** At \$200, the Z-560 system is one of the best values in PC sound. This THX-certified four-speaker setup produces sound that rivals that of systems costing \$100 more. [www.logitech.com](http://www.logitech.com)

## Best Projection System

**INFOCUS LS110** Our best-projector choice will cost you: InFocus's \$5000 LS110 uses DLP technology to produce a stunningly crisp and bright image. [www.infocus.com](http://www.infocus.com)

## Best Monochrome Workgroup Printer

**HP LASERJET 4100N** The second-fastest printer we've tested took top honors in print quality—a combination that more than justifies the 4100n's \$1550 price tag. [homeandoffice.hp.com](http://homeandoffice.hp.com)

## Best Ink Jet Printer

**EPSON STYLUS C80** The \$179 Stylus C80 features low ink costs, vivid photo prints, and fast printing speeds (6.9 ppm text and 1.5 ppm graphics). [www.epson.com](http://www.epson.com)

## Best Personal Laser Printer

**BROTHER HL-1440** Its \$300 price tag makes the HL-1440 as affordable as some high-quality ink jets—and a great choice for high-quality monochrome text output in your home office. [www.brother.com](http://www.brother.com)

## Best Color Laser Printer

**LEXMARK C720** Our color laser pick can cover all your workgroup's needs, from beautiful color prints to enough speed to churn out plain text. [www.lexmark.com](http://www.lexmark.com)

# Best Software

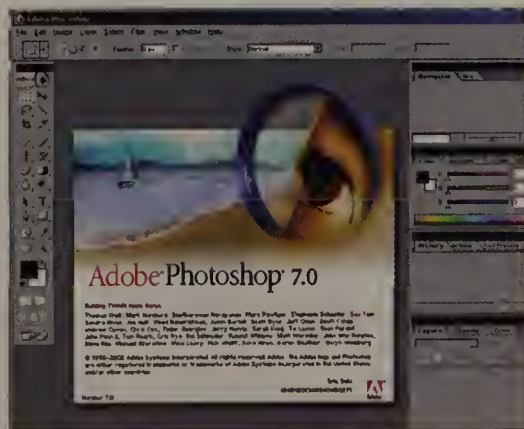


## Software Product of the Year, Best Freeware

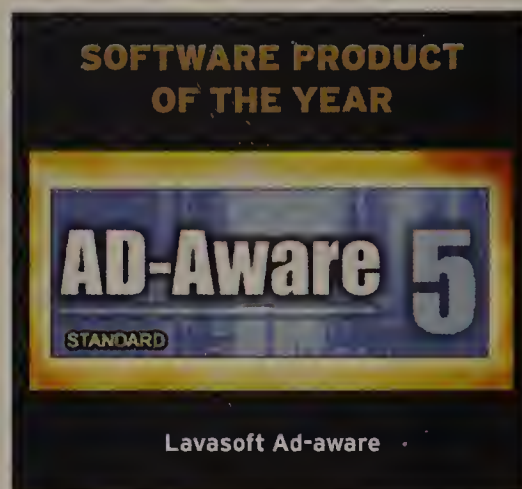
**LAVASOFT AD-AWARE** Ad-supported software (like the sponsored mode of Eudora)

has been around for years, but as software companies struggled to survive last year, many took ad support to new heights. That's how adware—software that downloads advertising while you use the associated application or at random—was born. This insidious trade, in which adware skulks onto your hard drive and can invade your privacy online, has proliferated, frustrating more than a few Internet users. Some people call such programs spyware, because in some cases they permit advertisers to continuously monitor your online activities.

There wasn't much anyone could do about adware until Lavasoft created Ad-aware, a simple, free program that scans your computer for the telltale files that adware plants on your system—and deletes them. Ad-aware regularly offers users fresh reference files that enable the program to find the latest spyware to invade their system, much as virus definition files help antivirus software clean up Windows. A one-of-a-kind utility, Ad-aware does its job quickly and efficiently (much to the chagrin of spyware makers), and it has become an indispensable tool in the fight for online privacy. [www.lavasoft.com](http://www.lavasoft.com)



**ADOBE'S PHOTOSHOP 7** adds new painting tools to an already full-featured package.



## Best Operating System

**MICROSOFT WINDOWS XP HOME EDITION (HOME), WINDOWS 2000 PROFESSIONAL (BUSINESS)** For home users familiar with the Blue Screen of Death in Windows 98 or Me, Windows XP (\$199, \$99 upgrade) is a revelation—an operating system that can go for weeks without crashing. Of course, Windows 2000 Professional (\$319, \$219 upgrade), built on the same core, has offered similar stability for over two years. Windows 2000 makes sense for most businesses, since Microsoft has had more time to work out the kinks in the software. But home users will like XP's compatibility with games and other home apps, and its ability to handle images and audio. [www.microsoft.com/windows](http://www.microsoft.com/windows)

## Best Web Browser

**MICROSOFT INTERNET EXPLORER 6** Despite serious competition from Netscape and Mozilla, Internet Explorer remains Web developers' primary target in compatibility tests. That helps IE 6 pull up almost any Web site without a hiccup, and it's a big part of the reason we name it Best Web Browser. [www.microsoft.com/ie](http://www.microsoft.com/ie)

## Best Application Suite

**MICROSOFT OFFICE XP** Indispensable—enough said. [www.microsoft.com/office](http://www.microsoft.com/office)

## Best Utility Suite

**SYMANTEC NORTON SYSTEMWORKS 2002** This \$70 suite meets your utility needs, including file recovery, disk scanning, and antivirus. [www.symantec.com](http://www.symantec.com)

## Best Backup Utility

**STOMP BACKUP MYPC** Let's face it: Backing up your data is no fun. That's why ►

## WORLD CLASS

## MOST PROMISING NEWCOMER

**HomePlug**

A Wi-Fi gateway took home our Hardware Product of the Year award, so we might as well admit it: We're hooked on networking. And anything that makes it faster and easier is a welcome change. Slow speeds and outlets the network wouldn't reach hampered early attempts at power-line networking, so we were skeptical when the first HomePlug network adapters arrived in our office. But solid trans-

fer rates of 5.5 mbps in our tests (the standard is rated at 14 mbps) with nary a non-working outlet banished our doubts quickly. Once the prices drop from their current vicinity of \$200 per adapter and a better selection of gateways becomes available, HomePlug products promise to make networking PCs as simple as finding and plugging into the nearest power outlet.



our Best Backup Utility selection is a \$79 program that makes the process as painless as possible. [www.stompinc.com](http://www.stompinc.com)

**Best Stand-Alone Utility**

**POWERQUEST PARTITIONMAGIC** Okay, so you don't repartition your hard drive every day. Still, it's hard to find a utility that handles a complex task better than the \$70 PartitionMagic. [www.powerquest.com](http://www.powerquest.com)

**Best Firewall**

**TIE: SYGATE PERSONAL FIREWALL PRO 5, ZONE LABS ZONEALARM PRO 3** Broadband users need a good firewall, and these products—priced at \$40 and \$50, respectively—excelled in our tests (see "Protect Your PC," page 92). [www.symantec.com](http://www.symantec.com)

**Best Antivirus**

**SYMANTEC NORTON ANTIVIRUS 2002** Also tops in our tests was Symantec's \$50 Norton AntiVirus 2002, a fine choice for PC virus protection. [www.symantec.com](http://www.symantec.com)

**Best E-Mail**

**PEGASUS MAIL 4** Powerful and intuitive mail-filtering rules, a new Outlook-style three-pane interface, and fewer worm threats than the big boys face make the free Pegasus our pick. [www.pmail.com](http://www.pmail.com)

**Best Remote Access**

**NETOPIA TIMBUKTU PRO** Simple and reliable, the \$160 Timbuktu Pro offers plenty of options for remotely controlling your PCs. [www.netopia.com](http://www.netopia.com)

**Best Instant Messaging**

**CERULEAN STUDIOS TRILLIAN** Tired of keeping three instant messaging clients on your machine? Trillian lets you talk to AIM, ICQ, or MSN members, and it's free. [www.ceruleanstudios.com](http://www.ceruleanstudios.com)

**Best Image Editing**

**ADOBE PHOTOSHOP 7** The gold standard in image editing software. For \$609, this year's version adds new painting tools and a helpful "healing brush" for touching up scans and photos. [www.adobe.com](http://www.adobe.com)

**Best Desktop Publishing**

**ADOBE INDESIGN 2** QuarkXPress has been the standard in publishing for years; but Adobe's \$699 InDesign has more-powerful features. [www.adobe.com](http://www.adobe.com)

**Best Drawing**

**COREL CORELDRAW 10** Its easy interface and capable Photo-Paint image editor give Corel's \$549 application the edge over Adobe's Illustrator. [www.corel.com](http://www.corel.com)

**Best Presentation**

**SERIOUS MAGIC VISUAL COMMUNICATOR** PowerPoint remains the standard for, well, PowerPoint-style presentations, but this \$150 video presentation package is simply amazing. [www.seriousmagic.com](http://www.seriousmagic.com)

**Best Video Editing**

**PINNACLE SYSTEMS STUDIO 7** The \$99 Studio 7 provides versatile editing options without Adobe Premiere-like complexity. [www.pinnaclesys.com](http://www.pinnaclesys.com)

**Best Web Design**

**MACROMEDIA DREAMWEAVER 4** Macromedia's \$399 Web editor boasts stellar layout tools and application development features; the new Dreamweaver MX, due in mid-June, integrates with Macromedia's other Web tools. [www.macromedia.com](http://www.macromedia.com)

**Best Personal Finance**

**INTUIT QUICKEN 2002** Improved online-banking and portfolio management tools cover your personal finances even better than last year's version. [www.quicken.com](http://www.quicken.com)

**Best Business Accounting**

**INTUIT QUICKBOOKS 2002** An enhanced find feature makes locating transactions easier, and new support for third-party filters increases QuickBooks' appeal for various businesses. [www.quickbooks.com](http://www.quickbooks.com)

**Best CD Burning**

**STOMP CLICK'N BURN** With a powerful and intuitive interface, the \$50 Click'N Burn covers all your CD-burning bases. [www.clicknburn.com](http://www.clicknburn.com)

**Best Game**

**INFOGRAMES CIVILIZATION III** Spend \$50 and conquer the world with this latest installment in Sid Meier's classic Civilization series. [www.civ3.com](http://www.civ3.com)

**Best PDA Software**

**BLUE NOMAD WORDSMITH** Rich formatting options, high-res fonts on color displays, and a dictionary and thesaurus give this \$30 word processor for Palms Word-like power. [www.bluenomad.com](http://www.bluenomad.com)

# Best Web Sites



## Internet Product of the Year, Best Search Engine

**GOOGLE** "God created the world," an anonymous sage once mused, "but it's held together with duct tape." Call

Google ([www.google.com](http://www.google.com)) the Internet equivalent of duct tape: a universal tool that stretches our perceptions of what a search engine can do. Which is why it's not just our Internet Product of the Year but also our overall Product of the Year.

Granted, the Web continues to endure Darwinian hard times. Most surviving sites are hunkering down, larding up with increasingly grating ads, and scrambling to convert freebie-loving surfers into paying customers. Even Yahoo ([www.yahoo.com](http://www.yahoo.com)), our perennial pick as Best Portal, has alienated some longtime users. But Google remains, well, Google. Though it does sport more ads these days, it preserves its lean, mean, and highly functional personality. And yup, it's still free.

Google has always pinpointed ordinary Web pages with eerie precision, but it now ups the ante by capably capturing a wide range of online content. For exam-



ple, Google indexes the contents of millions of files in Adobe Acrobat's Portable Document Format, and it lets you view these documents in your browser—no plug-in or download required.

Meanwhile, specialized Googles track specific types of information. Google News Search ([news.google.com](http://news.google.com)) lets you browse reports from an array of sources moments after they hit the Web. The massive newsgroup archive maintained at Google Groups ([groups.google.com](http://groups.google.com)) lets you get user reviews of a cool new digital camera or go back in time to glimpse how pioneering posters reacted to the first Space Shuttle launch in 1981. You can even rummage through digital replicas of dead-tree catalogs from companies like PC Connection and J. Crew, courtesy of Google Catalogs ([catalog.google.com](http://catalog.google.com)).

How good is this site? If you're too impatient to read our search-engine report ("The Straight Story on Search Engines,"

page 115), remember this simple three-word mantra: *Try Google first*. It's that accurate, that versatile, that indispensable.

## Best News and Information

**NYTIMES.COM** A Web site that served up a daily electronic version of "All the News That's Fit to Print" would be admirable in itself. But last year, when the most important news story in decades changed our lives overnight, nothing mattered more than expert reporting and analysis—and NYTimes.com continues to deliver exactly that. The site (free with registration) also capitalizes on the Internet's outstanding ability to combine text, audio, video, and graphics in new and innovative ways. A recent retrospective on the movie *The Shining*, for instance, included high-quality video of scenes that were discussed in the article, along with a link to the *Times*' original review of the film. Streaming audio clips feature music critics discussing new albums, interspersed with snippets from the albums. And the site's free e-mail newsletters can be custom-crafted to fit your specific interests. [www.nytimes.com](http://www.nytimes.com)

## Best Portal

**YAHOO** Our favorite site that still does a bit of everything, from e-mail to searches to auctions, continues to do them all well. Some of its once-free features now carry a fee, but Yahoo remains the Net's best one-stop destination. [www.yahoo.com](http://www.yahoo.com)

## Best Recreation/Entertainment

**FARK.COM** Irreverent, addictive, and more than a little cheeky, Fark.com has earned its place as the primo source of "Hey, check this out" links. [www.fark.com](http://www.fark.com)

## Best Web Shopping

**AMAZON.COM** Quick, where do you look first when you're shopping online? Okay, who said Kozmo? Amazon's huge selection and active community of user reviewers make it our favorite shopping site, and one of the most useful resources on the Web. No wonder it's still going strong. [www.amazon.com](http://www.amazon.com) ■

## WORLD CLASS

### LOSERS OF THE YEAR



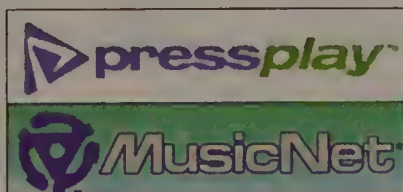
#### MusicNet, PressPlay

We understand why the music industry might worry about MP3s and file-sharing networks like Morpheus and BearShare. We can even see how reasonable people might think that copy-protecting CDs makes good business sense. So let's get this

straight: The recording industry

wants to kill digital music as we know it; and as an alternative, it's offering a service where you can download a limited selection of digital music files, but you can play them only as long as

you're a subscriber. Right. Until they're done well, services like MusicNet and PressPlay just add insult to injury. One suggestion to the labels driving these services: Ask the movie industry about a DVD distribution experiment called Divx.



# PROTECT YOUR PC

BY ROBERT LUHN &  
SCOTT SPANBAUER

ILLUSTRATIONS BY  
TAVIS COBURN

From dangerous new viruses to stealthy software, the assaults on your computer just keep coming. **Who's in charge here?** You—with these 26 well-tested tools.

YOUR HOME IS YOUR CASTLE, and your virtual home—your PC—should feel just as secure. However, protecting both requires vigilance against a multitude of intruders ranging from the merely annoying to the truly dangerous. Just as you must guard against miscreants breaking into your house or office to vandalize and plunder it, you must repel viruses and hackers trying to slip into your PC to wreak havoc and filch valuable personal or company data. And just as telemarketers can disturb your dinner, stealthware-laden

downloads and endless spam e-mail can ruin your appetite for going online.

You can protect your PC as you do your home or office, with a combination of strategy and the right tools. In this article we report on the dangers threatening your system and recap the results of our extensive performance testing and hands-on evaluations. Our findings will help you choose the best utilities for your PC-protection tool kit: antivirus, firewall, and antistealthware programs that lock out intruders; and antispam software and services that deflect the slings and arrows of outrageous e-mail marketing tactics. ►

## FIND IT HERE

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- 96 Shut Out Hackers
- 101 Stop Stealthware
- 104 Slam That Spam



## ELIMINATE VIRUSES

BY ROBERT LUHN

**Y**our antivirus program should be thorough, accurate, and fast. If it isn't, you simply won't use it—and neglecting this task is very dangerous. In any given month, between 200 and 300 viruses are

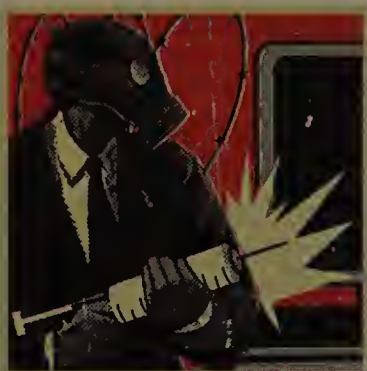
circling the globe. That number comes from the WildList, an internationally recognized monthly roster of viruses spreading “in the wild.”

An antivirus scanner's main method for catching viruses is to compare suspect code against databases of known virus “signatures.” These databases include current and previous WildList entries as well as tens of thousands of “zoo viruses” that mostly exist in labs but use tricks that future viruses may employ. Scanners also use methods such as heuristics in an ongoing effort to recognize virus-like behavior in new threats.

### THE ANTIVIRUS MOST-WANTED

VIRUSES TODAY not only are more potent than their predecessors, but can spread faster. In the 1980s, boot-sector viruses passed via traded floppy disks. By the late 1990s, e-mail transported macro viruses in attached Microsoft Word documents.

Now the danger comes mainly from mass-mailing worms—self-replicating



viruses that can hijack e-mail address books and send themselves to multiple recipients. LoveLetter, for example, was a Visual Basic script virus. Now most mass-mailing worms are stand-alone Win32 programs, such as SirCam and Klez, and

these programs make up the lion's share of all virus infections. Macro viruses trail a distant second, and script viruses come in a close third. Boot-sector viruses account for only about 1 percent of infections.

### ANTIVIRUS TO THE RESCUE?

ANTIVIRUS VENDORS have responded fairly well to the threats, judging from our evaluation of seven products: Computer Associates' ETrust EZ Antivirus 5.4, Kaspersky Lab's Anti-Virus Personal Pro 4, Network Associates' McAfee VirusScan 6.02, Norman's Virus Control 5.2, Panda's Antivirus Platinum 6.25, Symantec's Norton AntiVirus 2002, and Trend Micro's PC-cillin 2002. We evaluated programs intended for home or small-office use, but

all seven of these companies also offer multiseat licenses or server-based product lines.

The Norton, Kaspersky, and McAfee products zapped viruses best, but Norton earned our Best Buy award thanks to its intuitive interface.

To evaluate the software, we partnered with AV-Test.org, an agency run by the University of Magdeburg, Germany. The lab first tested how programs handled the

February 2002 WildList of 207 viruses packed into 414 files. Using each program's default settings and latest signature updates, we measured detection rates for both a full scan of the hard drive and a file-access scan (detection whenever a file is copied or opened). All but one program detected at least 99 percent of the in-the-wild viruses—a result we expected, since all vendors regularly track the WildList.

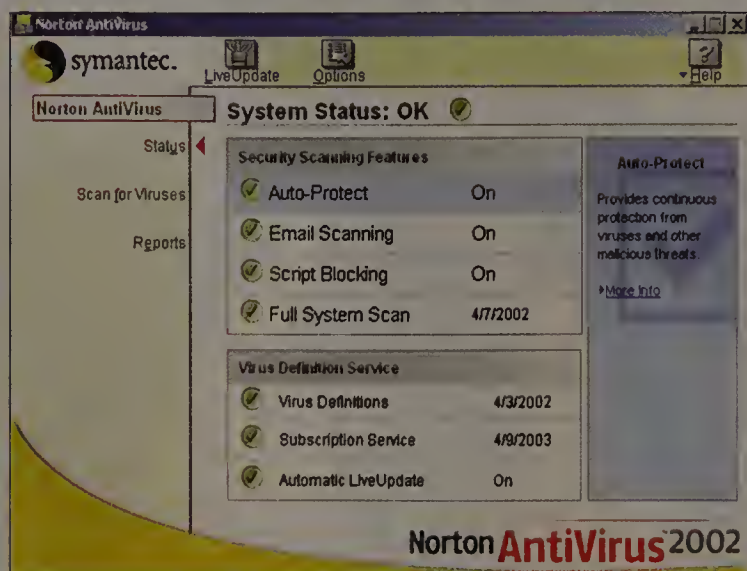
The scanners' in-the-wild failings surfaced only with boot-sector viruses. Trend Micro's PC-cillin missed all 22 of the boot-sector viruses in our file-access scans. After we alerted Trend Micro, the company issued a patch that allowed PC-cillin to find all boot-sector viruses in both the hard-drive and file-access tests.

For the tougher zoo tests—involving 9138 viruses in 42,426 infected files—AV-Test.org enabled the apps' highest security settings. The files included several thousand Trojan horses and backdoor programs—attachments or downloads that masquerade as useful files but contain destructive elements or may open your system to hackers. (The WildList doesn't track these threats, but they are monitored on a separate—and less-well-known—roster called the TrojanList.) AV-Test.org also tested against polymorphic viruses and worms, which mutate as they propagate, making them harder for antivirus scanners to recognize.

Kaspersky Anti-Virus, McAfee VirusScan, and Norton AntiVirus performed best in zoo tests. But we also found some sleepy sentinels. ETrust EZ Antivirus missed over half of the Trojan horses and backdoor programs, and over a quarter of the script viruses. Norman Virus Control and Panda Antivirus Platinum (a previous Best Buy) each let roughly 20 percent of the polymorphic viruses go undetected.

### DIG, DIG, DIG

WHILE THE TYPES of viruses a scanner finds are important, so are their locations. For example, your antivirus protector should be able to dig into .zip and other compressed files—even .zip files *within* .zip files. It should also screen e-mail



NORTON ANTIVIRUS 2002 offers the cleanest interface of the antivirus scanners we tested. From one place, you can check the program status, obtain updates, or run a hard-drive scan.

attachments. And wherever it discovers an infection, the program should remove it without destroying valuable files.

Kaspersky and McAfee did the best job of cracking into compressed files, and Panda was close behind. The other programs' performance ranked from so-so to abysmal. The worst: ETrust caught just 2 out of 24 compressed viruses.

Kaspersky, McAfee, Norton, Panda, and PC-cillin intercept and scan e-mail attachments before they land on your hard drive. But Norton and PC-cillin are limited to working with POP3-compliant e-mail programs, and Kaspersky works only with Microsoft's Outlook, Outlook Express, and Exchange clients. Panda scans POP3, Exchange, and even AOL attachments.

When they did find a virus, most products did a good job of removing it without damaging files, but only Norton turned in a perfect record. ETrust had the spottiest results: It successfully repaired just 18 of the 30 infected test files.

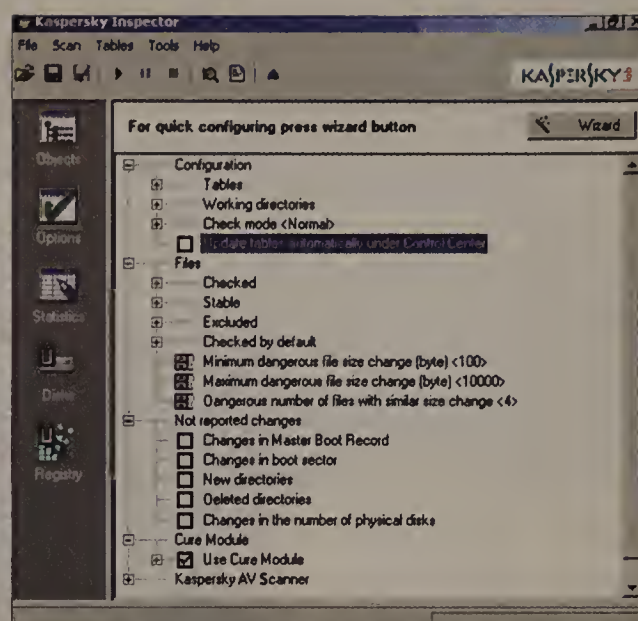
## LOOK AND FEEL

LAB TESTS tell only part of the story. The most sophisticated scanner is useless if you can't figure out how to run it.

Because new viruses show up all the time, easy virus-definition updating is a must. All the tested programs except ETrust offer automatic, scheduled updates; but our nod here goes to Norton, which by default checks for updates right after you install it and every 4 hours thereafter.

Norton earns kudos for having the most logical interface, too. From one location, you can view the program status and settings, as well as activate scans. You can also access Symantec's top-notch Web knowledge base to learn about viruses.

Other top scanners, such as Kaspersky, have a steep learning curve; but Norton is easy to master. And after you install the



**KASPERSKY LAB'S ANTI-VIRUS PERSONAL PRO 4, a powerful virus hunter, gives you considerable control, but its complex interface is difficult to navigate.**

application, it scans your hard drive and turns on every relevant virus-hunting feature. (Many competitors don't.) These excellent features, plus its virus-hunting prowess, make Norton the Best Buy. ►

## REPORT CARD

### VIRUS AVENGERS: NORTON IS HARD TO FOOL. EASY TO USE

| ANTIVIRUS SCANNER                                                                                                    | Street price (05/01/02) | Annual renewal fee | Wild viruses: success rate (full scan/file access) <sup>1</sup> | Zoo viruses: success rate (full scan) <sup>1</sup> | Ease of use | Comments                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------|-----------------------------------------------------------------|----------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Computer Associates ETrust EZ Antivirus 5.4<br><a href="http://find.pcworld.com/27541">find.pcworld.com/27541</a>    | \$20                    | \$10               | 100/100                                                         | 92.6                                               | Very good   | Has a clean, intuitive interface but disappointing performance. Missed some malicious apps and script viruses, and had problems scanning archive files in zoo tests. (★★★☆☆)                  |
| Kaspersky Lab Anti-Virus Personal Pro 4<br><a href="http://find.pcworld.com/27542">find.pcworld.com/27542</a>        | \$100                   | n/a <sup>2</sup>   | 100/99.5                                                        | 99.8                                               | Poor        | Complex interface is difficult to navigate. Missed some in-the-wild boot-sector viruses during file-access scanning. Provides e-mail scanning. (★★★★☆)                                        |
| Network Associates McAfee VirusScan 6.02<br><a href="http://find.pcworld.com/27543">find.pcworld.com/27543</a>       | \$40                    | \$5                | 99.5/100                                                        | 99.8                                               | Poor        | Strong virus scanning, aside from missing some in-the-wild boot-sector viruses during full scans. Includes a firewall, as well as virus scanning for PDAs. (★★★★☆)                            |
| Norman Virus Control 5.2<br><a href="http://find.pcworld.com/27544">find.pcworld.com/27544</a>                       | \$80                    | \$80 <sup>3</sup>  | 100/100                                                         | 96.5                                               | Fair        | Complex interface spread across six program components. Missed 20 percent of zoo polymorphic viruses; had difficulties with archived files. (★★★☆☆)                                           |
| Panda Antivirus Platinum 6.25<br><a href="http://find.pcworld.com/27545">find.pcworld.com/27545</a>                  | \$59 <sup>4</sup>       | n/a <sup>2</sup>   | 100/99.8                                                        | 96.2                                               | Good        | Integrates with Microsoft Outlook e-mail client; scans Lotus Notes databases. Missed 20 percent of polymorphic zoo viruses in our tests. (★★★★☆)                                              |
| <b>Best Buy</b> Symantec Norton AntiVirus 2002<br><a href="http://find.pcworld.com/27546">find.pcworld.com/27546</a> | \$50                    | \$10               | 100/99.8                                                        | 99.1                                               | Outstanding | One of the top performers also boasts the clearest, most intuitive interface of the products tested. It missed some script viruses and couldn't scan some archive files in zoo tests. (★★★★☆) |
| Trend Micro PC-cillin 2002<br><a href="http://find.pcworld.com/27547">find.pcworld.com/27547</a>                     | \$40                    | n/a <sup>2</sup>   | 99.5/94.7 <sup>5</sup>                                          | 97.9                                               | Good        | Missed high percentage of in-the-wild boot-sector viruses in our tests, but subsequent patch corrected the problem. Scans PDAs and includes a software firewall. (★★★★☆)                      |

Visit [find.pcworld.com/27548](http://find.pcworld.com/27548) for more detailed test results and a thorough description of our testing methodology.

n/a = Not applicable

<sup>1</sup> In percents.

<sup>2</sup> Free signature and engine updates until next major program release.

<sup>3</sup> Sold in two-year subscriptions only.

<sup>4</sup> \$30 for download version (does not include telephone support).

<sup>5</sup> Results before applying vendor patch. Afterward, results were 100 percent in both scans.

## SHUT OUT HACKERS

BY SCOTT SPANBAUER

**T**hough antivirus software protects you from many malicious programs, it might not catch everything. A hacker might attempt to snoop around your system for private passwords, for example,

or you might download a file or receive an e-mail attachment containing a backdoor program or a Trojan horse that steals data or opens vulnerabilities. A firewall can protect you from these types of attacks by continuously watching all the data flowing both into and out of your system.

We reviewed six software firewalls—Internet Security Systems' BlackICE PC Protection 3.5, Network Associates McAfee Firewall 3.02, Sygate Technologies' Personal Firewall Pro 5, Symantec's Norton Personal Firewall 2002, Zero-Knowledge Systems' Freedom Personal Firewall 3.2, and Zone Labs' ZoneAlarm Pro 3—to determine which provides the best protection without interfering with common applications or inundating you with false alarms. For comparison, we also examined the Internet Connection Firewall that accompanies Windows XP (but is turned off by default). AV-Test.org conducted all lab tests on Windows XP Professional systems, using the firewalls'



default security settings.

We were most highly impressed with Sygate's Personal Firewall Pro 5 and Zone Labs' ZoneAlarm Pro 3, so we gave both of them our Best Buy award. The Sygate product stands out for offering the finest control over how Internet-enabled programs can communicate. ZoneAlarm Pro, a previous Best Buy, has gotten even better with the addition of new ad-blocking tools, along with e-mail filtering and a better setup tutorial. Both Sygate and ZoneAlarm are also available in free editions that provide the basic firewall features.

### WHAT COMES IN? WHAT GOES OUT?

A FIREWALL'S PRIMARY job is to monitor each of the 65,535 possible TCP and UDP port addresses your system uses to communicate with other computers. If no application on your system is using a particular port, the firewall should ward off incoming data packets destined for it.

Most inbound "attacks" are simple port scans: hackers' attempts to find poorly configured, vulnerable servers. Since few users run the FTP, Telnet, and Web server applications that hackers typically look for, these connection attempts are usually harmless. On the other hand, Trojan horses, backdoor programs, and configuration errors—such as enabling file sharing without restrictions—can open vulnerabilities and give hackers the ability to copy files, delete files, or co-opt your PC and use it as a platform for

launching attacks on commercial servers.

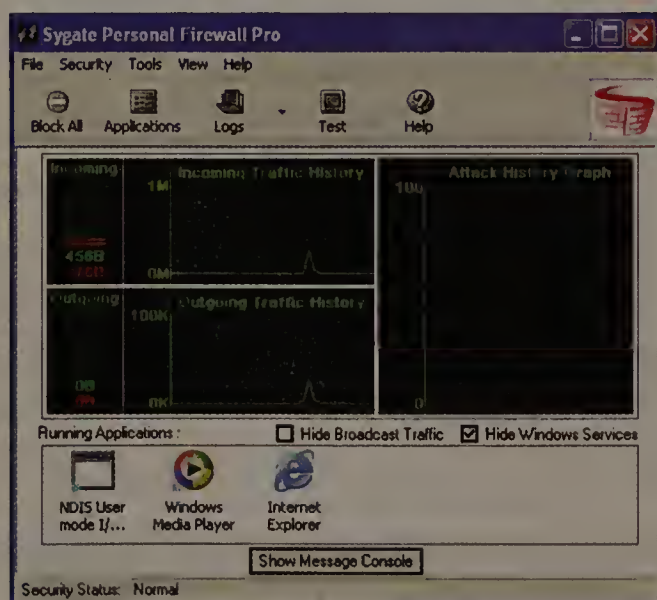
Running common port-scanning applications on all the firewalls (including Windows XP's), we found that most products protect all ports from attack. However, in their default settings with Internet access enabled, BlackICE PC Protection, Norton Personal Firewall, and McAfee Firewall do not close port 5000, which the Universal Plug and Play feature in recent versions of Windows uses to detect networked devices. Few products currently support UPnP, but it is enabled by default in Windows XP, thereby opening a server port. A McAfee representative says that in later versions of its firewall the company may add a check box to allow users to close port 5000. And by the time you read this, Norton should have a new, downloadable firewall rule that closes the port.

BlackICE not only leaves port 5000 open but also fails to close any ports over number 1024. According to ISS, pushing the program's security level from default 'Cautious' to 'Nervous' closes all TCP ports, and moving to the highest setting, 'Paranoid', closes all UDP ports, as well.

### KEEPING AN EYE ON APPS

THE BIGGEST DANGER to most PCs comes not from outside attacks but from within: Trojan horses and backdoor programs that you install because they appear to be useful downloads or harmless e-mail attachments. Once they've slipped into your system, these programs can turn your PC into a vulnerable server, opening ports to intruders or collecting data—such as passwords—and sending it to hackers. An up-to-date antivirus scanner is your first line of defense against Trojan horses and backdoor code, but if one of these does slip through, a firewall provides further protection.

The Windows XP firewall monitors inbound attacks only, but the six other firewalls we reviewed attempt to thwart Trojan horses and backdoor programs by controlling which applications on your system can connect with remote servers. Most of the firewalls alert you when an application wants Internet access, and ►



**SYGATE'S FIREWALL** presents a snapshot of monitored applications and Internet traffic in one screen.



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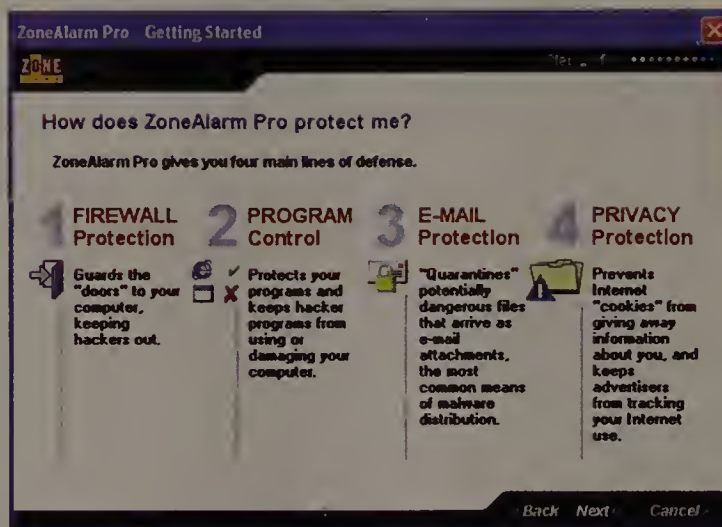
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they allow you to grant or deny permission. Symantec's Norton Personal Firewall makes the identification process easy by using a signature database of known, safe applications—for example, Web browsers and e-mail clients—to configure access rules automatically. If an application doesn't appear in the database, Norton will ask you to set permissions.

Unfortunately, Norton failed to alert us when we replaced an approved application with another application that had the same file name—a trick that a Trojan horse or backdoor program might try in order to slip past the firewall. Norton did ask permission for the replacement program to run, but it identified the app only by its file name. Similarly, BlackICE PC Protection and McAfee Firewall failed to note that the original file had been overwritten.

BlackICE suffered from other problems, too. We've awarded Best Buys to



**ZONEALARM PRO 3** has a vastly improved wizard that gives detailed advice on setting up and using the firewall.

earlier versions of the program because of their demonstrated ability to fend off and track attacks from outside. This time around, we focused more on application control, a feature that's new to the current version—but this feature failed to pass muster. By default, BlackICE grants full Internet privileges to any applications already installed on your PC. Because of

this setting, BlackICE was the only firewall (other than Windows XP's) that failed to block a backdoor program preinstalled on our test system. You can restrict applications after installing BlackICE, but that requires you to review its list of the several hundred executable files installed on your PC and to configure rules for each.

The star of the application control tests, Sygate's Personal Firewall Pro, was the only firewall that resisted our attempts to shut it down using a third-party system-monitoring application—mimick-

ing a trick some Trojan horses and worms use to disable a PC's security software.

## FEEDBACK AND CONTROL

MOST OF THE six non-Microsoft programs we tested do a good job of reporting possible outside attacks, by changing the utility's system tray icon, popping up a warning dialog box, playing a sound, or

## REPORT CARD

### PERSONAL FIREWALLS: SYGATE AND ZONEALARM PROTECT BEST

| FIREWALL                                                                                                                   | Street price (05/01/02) | Closed all ports by default | Detected preinstalled backdoor code | Announced file replacement | Resisted firewall shutdown attempt | Ease of use | Comments                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------|-------------------------------------|----------------------------|------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ISS BlackICE PC Protection 3.5<br><a href="http://find.pcworld.com/28405">find.pcworld.com/28405</a>                       | \$40                    | No <sup>1</sup>             | No <sup>2</sup>                     | No                         | No                                 | Very good   | Previously installed applications treated as safe. Uses stateful packet inspection (SPI), which provides more effective protection than static rules. (★★★★☆) |
| Microsoft Windows XP Internet Connection Firewall<br><a href="http://find.pcworld.com/28406">find.pcworld.com/28406</a>    | Free <sup>3</sup>       | Yes                         | No                                  | No                         | No                                 | Good        | Monitors inbound connections only, using SPI. No controls of Internet-enabled apps, no intrusion alerts; log files difficult to access. (★★★☆☆)               |
| Network Associates McAfee Firewall 3.02<br><a href="http://find.pcworld.com/28407">find.pcworld.com/28407</a>              | \$30                    | No <sup>1</sup>             | Yes                                 | No                         | No                                 | Good        | Uses static firewall rules. Doesn't support Internet Connection Sharing (ICS) on host machine that shares an Internet connection with other PCs. (★★★★☆)      |
| <b>Best Buy</b> Sygate Personal Firewall Pro 5<br><a href="http://find.pcworld.com/28408">find.pcworld.com/28408</a>       | \$40 <sup>4</sup>       | Yes                         | Yes                                 | Yes                        | Yes                                | Outstanding | Allows the finest control of traffic; only firewall preconfigured to support ICS. Includes SPI and intruder-tracing tools. (★★★★☆)                            |
| Symantec Norton Personal Firewall 2002<br><a href="http://find.pcworld.com/28409">find.pcworld.com/28409</a>               | \$50                    | No <sup>1</sup>             | Yes                                 | No                         | No                                 | Very good   | Offers application permissions that are preconfigured and adjustable. Able to block cookies and transmission of personal information. (★★★★☆)                 |
| Zero-Knowledge Systems Freedom Personal Firewall 3.2<br><a href="http://find.pcworld.com/28410">find.pcworld.com/28410</a> | \$30 <sup>5</sup>       | Yes                         | Yes                                 | Yes                        | No                                 | Very good   | Provides good protection but limited adjustability. Does not support ICS. Can block cookies, banner ads, and transmission of personal info. (★★★★☆)           |
| <b>Best Buy</b> Zone Labs ZoneAlarm Pro 3<br><a href="http://find.pcworld.com/28411">find.pcworld.com/28411</a>            | \$50 <sup>6</sup>       | Yes                         | Yes                                 | Yes                        | No                                 | Outstanding | Allows precise control of app permissions. Includes SPI and intruder-tracing tools. Can block cookies, banner ads, and pop-ups; filters e-mail. (★★★★☆)       |

<sup>1</sup> Leaves port 5000 open in default setting, though you can close the port through manual adjustment.

<sup>2</sup> All applications installed prior to BlackICE are granted Internet access by default. ISS recommends a full virus scan before installation.

<sup>3</sup> Included with Windows XP.

<sup>4</sup> Free for personal use.

<sup>5</sup> Annual subscription fee.

<sup>6</sup> Basic version available as a free download for individual and nonprofit use.

doing all three. However, Freedom Personal Firewall's alerts are rather vague, and you don't miss much information by keeping them disabled, as they are by default. All six display real-time logs of suspicious incoming traffic, showing the originating IP address, the type of attack, and in most cases its severity. In addition, Freedom, Sygate, and ZoneAlarm perform "Whois" traces that can sometimes pinpoint the source. Sygate's firewall also lets you do a trace route showing the exact path the attack took, from the source to your PC. Both techniques can help you identify a probable attacker's ISP so that you can report the abuse.

For application control, all the non-Microsoft firewalls except Freedom let you drill down to control settings and specify whether a program may initiate outgoing communications (acting as a client) or receive incoming connections initiated remotely (acting as a server). Sygate offers the greatest level of control, letting you dictate even specific days and times when a program can communicate.

### PROTECT YOURSELF WITH HARDWARE

MANY SMALL OFFICES and wired homes use inexpensive gateways/routers to share an Internet connection, files, and printers or other peripherals. The makers of gateways/routers often advertise built-in firewalls as well. How does this type of protection compare with a software firewall?

Using Network Address Translation and Dynamic Host Control Protocol, a basic hardware gateway/router such as the Linksys BEFSR41 EtherFast Cable/DSL Router (\$75) distributes private IP addresses to computers on the network. It transforms those private addresses into its public IP address in the course of sending communications to Internet servers. Because the individual PCs don't have their own public IP addresses, they should be protected from outside attacks. We found the four-port Linksys to be simple to install. We didn't have to enter its setup screen because it retrieved a dynamic IP address from our ISP and then

created a NAT network automatically.

More-expensive routers such as NetGear's eight-port FR318 (\$250) add other safeguards, including stateful packet inspection, which scrutinizes both the address headers and the contents of data packets for signs of suspicious behavior. (Many of the software firewalls that we reviewed also use SPI.) In contrast, firewalls that use static rules look only at address headers; they are more susceptible to advanced attacks that disguise the packet's true source. The NetGear router required more work to configure during setup than the Linksys did, but it offers handy

Internet content filtering that lower-cost routers like the Linksys don't. However, even advanced hardware firewalls can't perform the application checking that the software products can.

Hardware firewall manufacturers agree that software adds a layer of protection. Linksys, for example, has joined with Zone Labs to offer discounted multiple-computer ZoneAlarm Pro licenses along with its routers. And NetGear offers buyers of its RP114, RP334, RT311, and RM356 firewall routers eight free one-year subscriptions for Zero Knowledge's Freedom security and privacy suite.

## STOP STEALTHWARE

BY SCOTT SPANBAUER

**D**o you ever suspect that someone else is calling the shots on your PC? You're not doing anything online, but the modem lights show that your system is sending and receiving data. One

day you research a Caribbean vacation, and the next day ads start popping up on your screen pushing Jamaican getaways. Is someone out there watching you?

Well, the snoops aren't watching *you* exactly—rather, they're watching (and recording) your mouse clicks. Much of that "free" software you've been downloading has a cost, after all. In addition to the banner advertisements that clutter the interfaces of many free programs, products such as BearShare, Kazaa Media Desktop, and the "sponsored" version of Qualcomm's Eudora e-mail application come packed with a hidden payload: stealthware programs that track your surfing activity and send data on where you go back to a mothership marketing server.

Also dubbed spyware or adware (the latter delivers targeted advertising but does not collect personal information about you), these covert programs use the bandwidth and processor power you paid for to sell you stuff. And a new class of stealth-



ware co-opts your computer's resources for other purposes: Earlier this year, users of Kazaa Media Desktop discovered that the Brilliant 3D viewer that was installed along with the file-sharing application was a client for a soon-

to-be-activated distributed-processing network. While the download is free, anyone who decides to get it winds up paying for it in the form of CPU cycles.

This novel arrangement isn't a complete secret. When you accept the terms of the Kazaa software license, you also grant Brilliant permission to use your PC's processing power and Internet connection. But few people, if any, scroll far enough down the Kazaa user license to read the terms of the embedded Brilliant license. To see whether a program contains stealthware before you install it—without getting bleary-eyed from reading through the license—check the online database of stealthware-bearing applications maintained at Spychecker.com. ►

## REPORT CARD

## STEALTHWARE FINDERS: AD-AWARE CATCHES THE MOST

| UTILITY                                                            | Street price (5/01/02) | Scans memory/storage | Removes programs | Comments                                                                                                                                  |
|--------------------------------------------------------------------|------------------------|----------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Best Buy</b> Lavasoft Ad-aware Plus 5<br>find.pcworld.com/28401 | \$15                   | Yes/Yes              | Yes              | Tool provides extremely thorough scanning and removal of stealthware. Separate utility assists with updating. (★★★★☆)                     |
| PestPatrol 3.1<br>find.pcworld.com/28402                           | \$30                   | Yes/Yes              | Yes              | Utility has a slightly more difficult interface and less-thorough scanning than Ad-aware. Manual updates. (★★★★☆)                         |
| Spyblocker Software Spyblocker 5<br>find.pcworld.com/28404         | \$20                   | Yes/No               | No               | Real-time memory scanner blocks a broad range of stealthware, ads, cookies, and Web bugs. Separate utility assists with updating. (★★★★☆) |
| Spybot Search and Destroy .95<br>find.pcworld.com/28403            | Free                   | Yes/Yes              | Yes              | Student-written beta freeware offers thorough scanning and an impressive feature set. Manual updates. <sup>1</sup>                        |

<sup>1</sup> Star ratings not assigned for beta software.

## STEALTHWARE FIGHTERS

TO UNCOVER STEALTHWARE that is already lurking in your system, you can use a utility that scans for it in much the same way that antivirus programs scan for viruses. We examined four such protectors: LavaSoft's \$15 Ad-aware Plus 5, PestPatrol's \$30 PestPatrol 3.1, Spyblocker Software's \$20 Spyblocker 5, and the freeware SpyBot Search and Destroy .95.

Ad-aware Plus and PestPatrol are the most full-featured spy hunters of the four, and Ad-aware Plus earned the Best Buy title mainly because it found and disabled many more scary programs in our tests than PestPatrol did. Notably, PestPatrol missed the Brilliant 3D viewer and its dormant distributed computing client. Also, Ad-aware Plus's wizard-like scanning and

spyware removal process is easier to navigate than PestPatrol's tabbed interface. Otherwise, the two programs behave very similarly. Both scan your hard disk and Registry for signatures of known spyware, and both scan your PC's memory to catch stealthware while it's running.

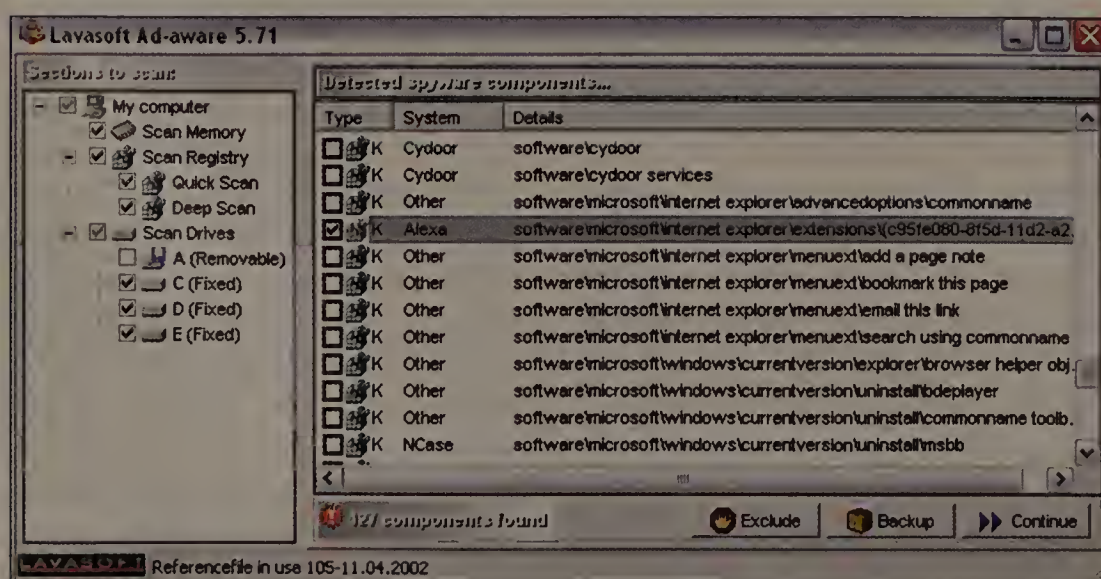
Before purging your PC with one of these utilities, remember that some free programs may stop working if you remove their hidden components. If you can't give up a prized application but you don't like what it does behind your back, use an application-monitoring firewall, such as one of our Best Buys (Sygate Personal Firewall Pro or ZoneAlarm Pro 3), to block unwanted background traffic.

Ad-aware and Pest Patrol are available in free versions, but we recommend the full packages because of the additional

features they provide. The free version of PestPatrol, for example, lacks the ability to quarantine or delete stealthware; you'll have to remove it manually. Ad-aware's free version leaves out the memory scanner and other advanced features, including the useful ability to run a scan directly from Windows Explorer.

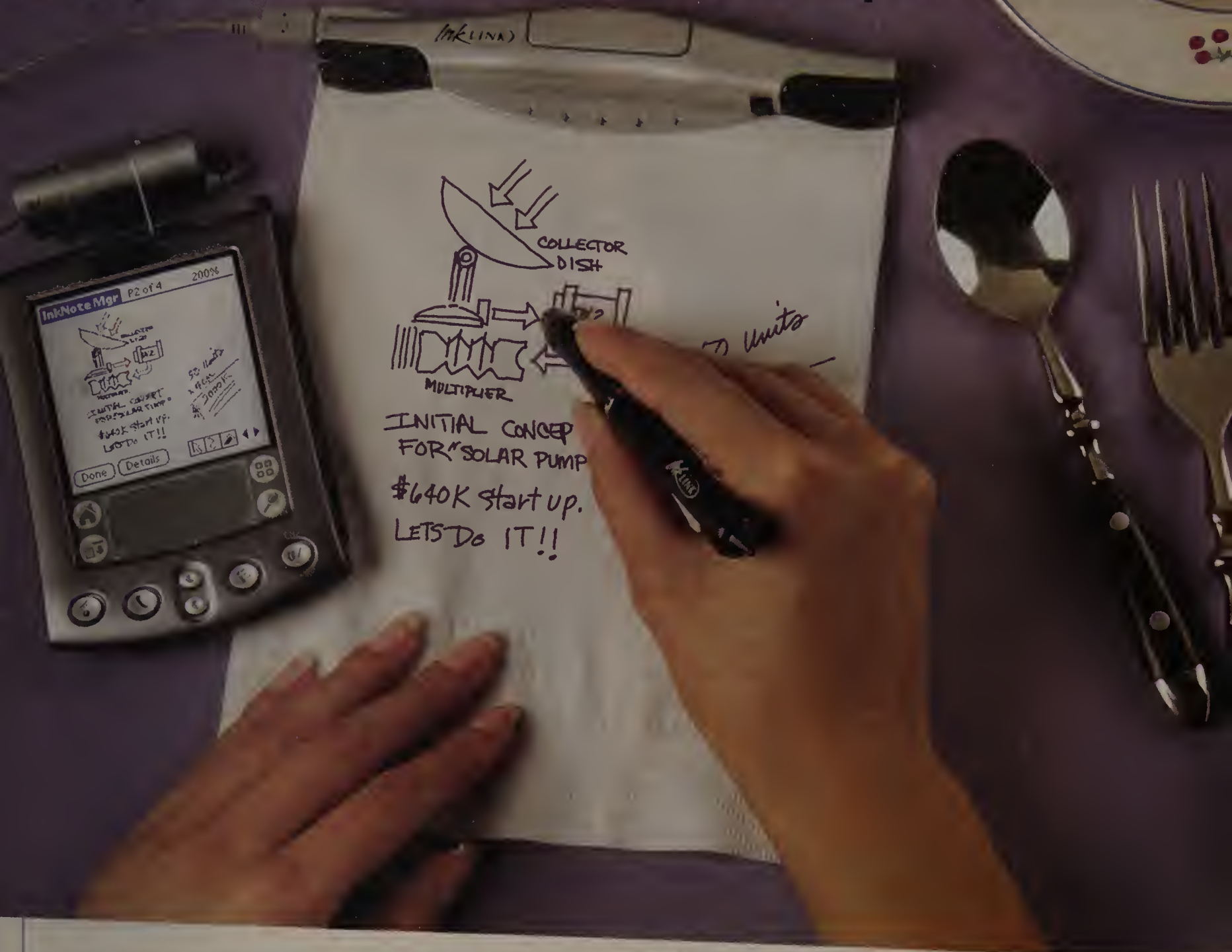
Like antivirus software and firewalls, stealthware blockers require program and signature updates to trap the newest culprits. PestPatrol can automatically download updates from the company's Web site. Ad-aware Plus uses a separate program that streamlines the downloading and installation of signature-file updates, though it does not run automatically.

The two other programs we tested deserve honorable mention. SpyBot Search and Destroy .95 is a promising freeware program that was in development during our research; it's nearly as thorough and feature-rich as Ad-aware Plus. Spyblocker is a real-time memory scanner that watches for a host of online threats, including Web bugs, ads, worms, spyware, scripts, and cookies. Like the application-control feature provided by a personal firewall, Spyblocker prevents stealthware from connecting to remote servers. The program also automatically blocks programs from communicating with servers that are associated with a long list of known stealthware domain names. However, Spyblocker doesn't scan your hard disk and remove offending programs. ►



LIKE AN ANTIVIRUS SCANNER, Ad-aware Plus searches your system for known stealthware so you can delete it. The program found more offending applications than rival utilities did.

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## SLAM THAT SPAM

BY ROBERT LUHN

**C**ompared with the trashing a virus or hacker can do to your PC, spam seems so, well, benign. But virus attacks don't happen every day, whereas junk e-mail does. The productivity you

lose in sifting through this digital detritus, plus the hijacked server space and bandwidth, can put a dent in your budget or threaten your sanity.

Many ISPs offer customers spam-filtering services, but these aren't always vigilant. "Even [ISPs] with a good abuse desk find it difficult to disconnect a customer—even a spammer—in the current economic climate," says Dave Rand of the Mail Abuse Prevention System, an antispam advocacy group. And ISPs that have antispam technology still let plenty of junk through. For example, a seldom-used AOL screen name that we monitored received nearly a dozen junk messages each day. After forwarding the messages to AOL, adding the spammers' names to the account's filters, and unsubscribing from mailing



lists, we *still* received the same amount of spam.

### GOING VEGETARIAN

YOU PROBABLY can't rid yourself of the junk entirely, but you can reduce the flow by choosing an ISP with a tough

antispam policy, mastering your e-mail program's filter function, and being careful about which Web sites and services you sign up with. For detailed advice on how to proceed, follow the tips in "Spam Begone" ([find.pcworld.com/27401](http://find.pcworld.com/27401)) and in June's "How to Take Back Your Privacy" ([find.pcworld.com/28221](http://find.pcworld.com/28221)).

You can also enlist the aid of programs and Web-based services that filter out the remaining spam, check sender addresses against a "blacklist" of spammers, or provide heavily filtered or temporary e-mail

addresses. We tried four products—Contact Plus's Spam Buster 1.9, Crystal Office Systems' MailSweep 3.05, High Mountain Software's SpamEater Pro 3.56, and McAfee.com's SpamKiller 2.87—and ran them on several active e-mail accounts. Most of them effectively nabbed the real spam and spam-like messages we sent to the accounts, without zapping innocent e-mail, but we recommend SpamKiller because it's the easiest to use.

### ANTISPAM TOOLS

EXCEPT FOR SPAMKILLER, these four programs work only with POP3 e-mail accounts (which excludes AOL, MSN, some corporate e-mail systems, and Web-based e-mail such as Hotmail). Most of them compare return addresses with various blacklists, and they provide filters to block messages by address, domain, country, and size. All four programs scan your inbox (on demand or automatically) for suspicious mail and either flag it or delete it.

SpamKiller emerged as our Best Buy choice, by a whisker, thanks to its clean interface and a superb wizard that finds your e-mail program and imports the address book (labeling everyone in it a non-spammer). The software is a snap to ►

## A Suite Deal?

SOFTWARE SUITES promise an irresistible deal. Why buy different apps from different vendors when a single package can do the job (and save you money)? Unfortunately, many suites resemble TV networks' fall lineups, with uninspired offerings crammed between the winners.

We examined two suites—Symantec's Norton Internet Security 2002 and Network Associates' McAfee Internet Security 4.02—that include at least an antivirus scanner and a firewall. Each sells for \$70. Zero-Knowledge added a virus scanner to its firewall and pri-

vacuity package, Freedom 3.2, but not in time for our testing.

Norton packages AntiVirus 2002 (our Best Buy) and Personal Firewall 2002, plus several privacy tools, such as an ad blocker. The McAfee suite combines VirusScan 6.02, Firewall 3.02, and a similar posse of privacy protecting applications.

### KLUDGEY COMBOS

ALAS, NEITHER SUITE is ready for prime time. Norton's console is inconsistent: Some status screens allow you to configure an application; others kick you out to the main configuration

screen. Some screens show if a feature is enabled, some don't.



McAfee's Internet Security 4.02 suite has the same confusing Web-style interface that the stand-alone VirusScan uses. Many options are buried, and key apps, such as the firewall, aren't turned on by default.

Once configured, the McAfee suite produced mixed results.

The ad blocker let skyscraper and pop-up ads through. The Security Check feature, a cool idea, whips through your PC looking for information that should be secured. It makes some good suggestions, but also some bad ones, such as turning *on* your CPU identification feature. Like Norton's suite, the McAfee bundle does not include utilities to filter spam.

Our recommendation? While an all-in-one security package may sound appealing, you're better off building your own suite from our Best Buys.

—Robert Luhn

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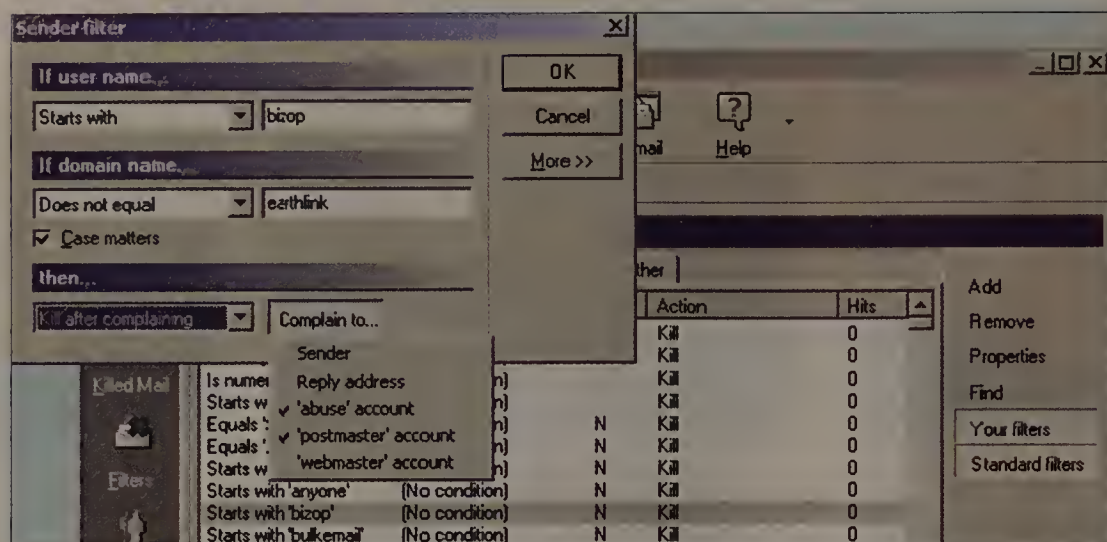
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**TO CREATE A FILTER in SpamKiller, you select prefab rules from drop-down menus. You can even have spam automatically sent back to the offending source.**

run: Buttons activate basic features (like checking mail), while a toolbar lets you scan your in-box or edit filters. And SpamKiller is the only program of the four that also works with the MAPI e-mail used in Microsoft Exchange systems. It doesn't use a blacklist of known spammers, but it does have a load of preconfigured filters that were effective in canning the junk.

Coming in a close second is Spam Buster, which uses its own blacklist. The tabbed dialog boxes where you configure the program are straightforward, and you can select filter rules from simple drop-down menus. But Spam Buster's wizard

isn't quite as intelligent as SpamKiller's.

Spam-haters who want total control should try SpamEater Pro. You can craft rules and filters any way you wish, check a half-dozen blacklists, and have messages re-sent if you suspect that legitimate e-mail got swept up with the spam. But SpamEater is hard to configure, requiring lots of puzzling over arcane settings.

MailSweep, a mail-reading program with antispam features, fared less well. It doesn't have prefab filters or blacklists, and you can't create complex filters. While it caught some spam, it didn't always delete messages when instructed to do so.

## ANTISPAM AT YOUR SERVICE

WEB ANTISPAM SERVICES block junk mail before it gets to you, and they work with all types of e-mail. We tried out two free services, Despammed and Spammgourmet. Both of them provide e-mail addresses for signing up with Web sites, newsletters, or forums.

The Despammed service filters incoming mail and sends whatever remains to your real e-mail address. The site has its own filtering technology but also checks several blacklists. Spammgourmet forwards mail without filtering, but each Spammgourmet address is good for only 20 messages. If you sign up for something you don't like, you can simply let that particular e-mail address expire.

While the free services work as advertised, the software packages offer greater control. If you have a POP3 or a MAPI e-mail account and a serious distaste for spam, spend the \$30 on SpamKiller. ■

*Robert Luhn is a California-based freelance writer. Scott Spanbauer is a PC World contributing editor. Dr. Andreas Marx of the University of Magdeburg directed antivirus and firewall testing. Special thanks to Sarah Gordon of the WildList Organization International and Steve Gibson of Gibson Research.*

## REPORT CARD

### SPAM FIGHTERS: SPAMKILLER HAS THE MOST MUSCLE

| UTILITY                                                                                                          | Street price (5/01/02) | E-mail types supported   | Comments                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Contact Plus Spam Buster 1.9<br><a href="http://find.pcworld.com/27421">find.pcworld.com/27421</a>               | \$20                   | POP3                     | Simple, logical interface; built-in blacklist; no inline ads. Free, ad-supported version available. (★★★★☆)                               |
| Crystal Office Systems MailSweep 3.05<br><a href="http://find.pcworld.com/27422">find.pcworld.com/27422</a>      | \$19                   | POP3                     | Mail reader with antispam features, limited filters. Free 30-day demo has minor features disabled. (★★★☆☆)                                |
| High Mountain Software SpamEater Pro 3.56<br><a href="http://find.pcworld.com/27423">find.pcworld.com/27423</a>  | \$25                   | POP3                     | Offers in-depth control, multiple blacklists; hard to configure; help system terse. Free, fully functional 30-day demo available. (★★★★☆) |
| <b>Best BUY</b> McAfee.com SpamKiller 2.87<br><a href="http://find.pcworld.com/27424">find.pcworld.com/27424</a> | \$30                   | POP3, Microsoft Exchange | Great wizard, easy setup. Free, fully functional 30-day demo available. (★★★★☆)                                                           |
| SERVICE                                                                                                          |                        |                          |                                                                                                                                           |
| Despammed<br><a href="http://find.pcworld.com/27425">find.pcworld.com/27425</a>                                  | Free                   | Any                      | Filters mail, then forwards it to your primary account. (★★★★☆)                                                                           |
| Spammgourmet<br><a href="http://find.pcworld.com/27426">find.pcworld.com/27426</a>                               | Free                   | Any                      | Forwards mail from temporary e-mail addresses to your primary account. (★★★★☆)                                                            |

# FOCUS<sup>TM</sup>

YOUR SOURCE FOR INFORMATION ON COMPUTER TECHNOLOGY

## Choosing the Right Server



*It wasn't all that long ago that a server was simply a powerful PC acting as a central repository for shared files. Then came enterprise computing and the Internet with scores of critical applications, and suddenly server hardware was expected to run at top-notch performance 24 hours a day, 365 days a year. In this edition of Focus, we'll examine the spectrum of server products available today, and discuss how each can best be used to benefit a business.*

The crushing demands of e-business computing have spawned a veritable cornucopia of server types and features, all geared to nonstop, high-performance computing, but each optimized for the particular demands of a set of applications and environments. Today you have entry-level, midrange, and mainframe-class servers; server appliances and general-purpose servers; small business, branch office, departmental, enterprise, and datacenter servers; freestanding, rack-mount, 1U ("U" stands for rack unit, or 1.75 inches), and blade servers; single, dual, and multiprocessor servers; Pentium, Xeon, RISC, and Itanium servers; Intel/Windows and RISC/UNIX servers; standalone, clustered, and load-balanced servers—all overlapping in functionality and purpose, and all vying for your precious server dollars. Underlying all these server power and configuration options are all the "ilities"—manageability, expandability, reliability, availability, scalability, serviceability, usability—that vary across all the different platforms and server options.

Things have gotten mighty complex out there, but by considering carefully the demands of your server-hungry environment and applications, and matching the "ilities" offered by the various server options to those tasks, you can find the right server or servers for your needs. To help you find your way through this server morass, we'll discuss

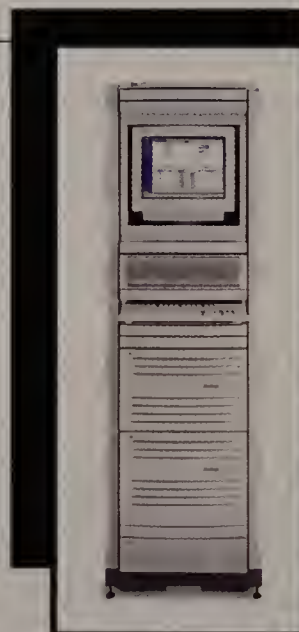
performance and the "ilities" you need to consider, as well as the numerous server categories you have to choose from. Then we'll run through a number of server environments and applications, and suggest a server type and configuration for each.

### ● Addressing the Intangibles

When it comes to choosing the right server for a certain environment or application, performance may be the first requirement that comes to mind. It's certainly important to assess your performance needs carefully and configure a server appropriately. Depending on the application, processing performance may be all important, or you may need a copious amount of memory, fast I/O, or all of the above.

When it comes to choosing servers, performance is only one of many important variables. Frequently, there aren't tremendous speed differences among server products in the same performance class. In today's world of increasingly nonstop computing, it's often the "ilities" that make the difference, and determine the type and class of server you purchase.

**Scalability** refers to how easily you can increase server power to support a larger user load, more demanding applications, or both. This is important, because in today's e-business environments, user



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loads and application requirements are hard to predict and can quickly outstrip the capabilities of existing server configurations. Scaling up—which means adding processing power, memory, storage, and connectivity to an existing server—is an important requirement for a general-purpose small business server or a server being used to consolidate several applications currently running on a number of other systems for easier management. It's also an important consideration for servers running large-scale databases that handle complex requests, encryption applications, and certain scientific and technical applications that need a lot of memory and processing power.

Bear in mind, however, that for applications that take numerous streams of smaller requests (such as Web and application servers), scaling out, which means simply adding more less-expensive servers to a server farm, is another very viable option. These servers may work together as one to support a larger user or application load (say in a load-balancing or parallel-processing configuration), or they may simply work alone, with each server dedicated to a specific department or service provider account.

Server load balancing acts like a traffic cop, distributing streams of small and medium-sized Web and application requests across banks of servers, taking into account CPU load, request type, and other factors to achieve maximum performance and reliability. Thanks to network address translation (NAT), that bank of servers appears to the user as a single system or IP address. For the right applications, load balancing is a great, inexpensive way to scale performance out, as most solutions allow you to add servers on the fly during peak use periods.

Parallel processing, also known as high-performance clustering, takes big, processing-intensive tasks and divides them into smaller, more manageable chunks that can be distributed across a bank of servers or workstations, each of which works on its own chunk in parallel with the others. The results are then sent back to a clustering server that assembles them for presentation. With the right types of application tasks—particularly scientific, technical, and financial application tasks that typically run for hours or days and have a high processing-to-data ratio—distributed computing can provide up to supercomputing power for a fraction

of the cost of a midrange or mainframe system or supercomputer.

When deciding what types of servers to purchase, you'll want to determine whether it makes more sense for your applications and environment to be able to scale up or scale out.

**Reliability and availability** go hand in hand. Both refer to the types of features offered by a server or bank of servers to keep them up and running all the time. This usually means redundant components like power supplies, fans, and storage, as well as self-monitoring and prefailure notification—a combination of hardware and software features that allow systems to predict component failure and alert the administrator before it happens. Redundancy simply means that if a power supply or other component fails, there's another one there to take its place immediately.

High-availability clustering takes redundancy to the next level, replicating the entire server such that if the first server in the cluster fails, it's quickly replaced by a second server that is a mirror image of the first, so that it takes the first's identity and keeps applications running without users noticing much of an interruption,

## Intangibles Explained

Performance is an important metric to consider before purchasing a server, but so are the intangibles, commonly referred to as “ilities.”

|                                       | What Is It?                                                                                    | How to Address It                                                                                                                                                  | Who Needs It?                                                                                                                                                                                                                          |
|---------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Scalability</b>                    | How easily server power can be increased to support more users or more demanding applications. | <p><b>Scale up:</b> Add more CPUs, memory, storage, and connectivity to an existing server.</p> <p><b>Scale out:</b> Add more servers to existing server farm.</p> | <p>General-purpose server; consolidation of several apps running on different servers; servers running large databases.</p> <p>Web or app servers that take many streams of small requests (servers may work alone or in concert).</p> |
| <b>Reliability &amp; availability</b> | Features geared toward 24/7 server availability.                                               | Redundant components; self-monitoring features; components that can generate prefailure notification; clustering.                                                  | Any app critical to business continuity and bottom line.                                                                                                                                                                               |
| <b>Manageability</b>                  | Features that allow you to monitor performance and availability.                               | Hardware prefailure and threshold alers; event logs; activity histories.                                                                                           | Larger, multi-location companies; any app critical to business continuity.                                                                                                                                                             |
| <b>Usability</b>                      | Ease of startup and operation.                                                                 | Appliance servers; software utilities; preconfigured server solutions.                                                                                             | Small business, branch office, environment without IT support; IT dept. that must add new servers quickly.                                                                                                                             |
| <b>Serviceability</b>                 | Features that make servers easy to fix.                                                        | Enclosures that allow complete servicing of all components without tools.                                                                                          | Rack environments; any app critical to business continuity.                                                                                                                                                                            |

if any. For large database applications, clustering can be an essential component of your availability strategy. For Web applications, load balancing also improves availability, as most solutions can detect a failed server or application and quickly redirect requests to available servers without so much as a hiccup.

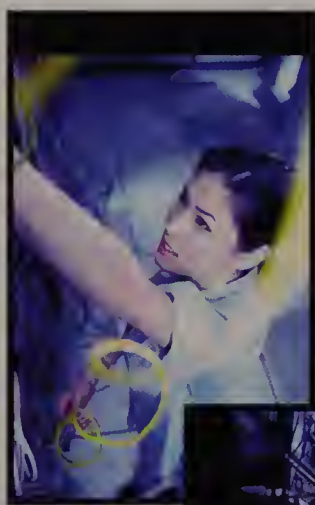
**Manageability** reflects the software and hardware features that allow you to monitor the performance and availability of your server remotely, and take the necessary steps to restart the server or fix problems without the need for a human to stand in front of the server itself. As the number of servers in the average enterprise multiplies, manageability becomes more and more important for detecting and solving small problems before they become big problems.

Server vendors offer a host of management options, including various types of performance-monitoring capabilities, hardware prefailure and threshold alerts, event logs, activity histories, and hardware and software inventory information. Many let you dial in and take control of a server out of band, even if that server has shut down, or automate BIOS updates and software distribution. In certain configurations of multiple servers, manageability is about to take a giant leap, allowing you to merge all that server power into a single pool that can be provisioned and reprovisioned to applications at will.

**Usability** simply refers to the ease of getting up and running. That can include everything from configuring the right components to setting up and tweaking all those operating systems, applications, drivers, network settings, and other parameters you need for smooth operation. Usability is becoming more and more important as home offices, small businesses, branch offices, and other environments without the requisite networking expertise become an increasingly larger slice of the server market. But it can be just as important to a service provider or IT department that needs to add servers and functions quickly.

Server vendors and CDW offer a whole host of utilities for easing setup and configuration, as well as server solutions that come to your doorstep with just about all the components, software, and settings preconfigured to get you up and running. Perhaps the greatest extreme in terms of usability is the appliance server, which hides all that operating system and application complexity in a box that you simply plug into the network, and with a few quick configuration steps, get up and running.

**Serviceability** refers to the features of a server or rack that make it easy to open the case and pull out components should you need to do so. These include tool-free cases that let you swap out most components by using thumbscrews, lifting levers and tabs, pressing buttons, or sliding out shelves. The most serviceable systems generally



make everything easily accessible and give you plenty of room to work, but you may sacrifice compactness in the process.

## ● Appliance or General Purpose?

Performance and the "ilities" are very important considerations. But another is determining the server category (or categories) best suited to your applications and environment. One of the hottest server categories in the market today is the server appliance. If you and your server needs fit any of the descriptions below, you should definitely consider this category before leaping into a typical general-purpose server solution:

- You're a **small business** without a great deal of IT expertise looking to get its Internet, file, and messaging services up and running quickly.
- You're looking for a quick way to **relieve an overtaxed server** of some of its application load.
- You're looking for an easy way to **add a new function to your network**—say, a firewall or virtual private networking—without having to acquire a whole new area of expertise.
- You're a service provider looking for a **fast, reliable way to populate your datacenter** with large numbers of Web or application servers, each dedicated to a single account.

Believe it or not, the answer to all of these needs may be a server appliance.

What exactly is a server appliance? It's a turnkey box that comes preconfigured with hardware, dedicated application software, and a stripped-down operating system that has been combined carefully by the vendor to perform a few fixed functions very well. The vendor has hidden all the complexity of the system and tuned the package for maximum usability, fast performance, and reliability. In most cases you won't even know what hardware is inside or what OS is running. You simply plug the box into the network—no PC server or monitor required—set an IP address, fill in a few simple Web-based forms remotely from a desktop using a browser, and you'll be up and running.

Compared to the total cost of a typical server, its operating system, and the applications it will run, server appliances are generally much less expensive. When you factor their incredible ease of installation and use into the equation, you'll find that they can have a lower cost of ownership as well. Most appliances can be configured, managed, and tweaked remotely, which makes them great for branch offices.

Server appliances are available from a host of well-known vendors including Compaq, Hewlett-Packard, Intel, Quantum, Sun

## Server Appliances

Here's just a small sampling of the many task-specific appliances available today. For more information, visit [www.cdw.com](http://www.cdw.com).

|                      | Vendor                                                  | Product                                                                                                             |
|----------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>NAS</b>           | Compaq<br>Maxtor<br>3Com<br>Intel<br>Linksys<br>Quantum | TaskSmart<br>MaxAttach<br>OfficeConnect<br>InBusiness Storage Station<br>EtherFast Instant GigaDrive<br>Snap Server |
| <b>Cache</b>         | 3Com<br>Cisco<br>IBM<br>Sun                             | Superstack 3 Web Cache<br>Cache Engine<br>Internet Caching Appliance<br>Sun Cobalt CacheRaQ                         |
| <b>Load Balancer</b> | 3Com<br>Cisco<br>HP<br>Intel                            | SuperStack 3 Server Load Balancer<br>LocalDirector<br>e-Commerce Traffic Director<br>NetStructure Traffic Director  |
| <b>Multifunction</b> | Compaq<br>Nortel Networks<br>Toshiba                    | NeoServer<br>Contivity line<br>Magna Appliance Server                                                               |
| <b>Web Server</b>    | Compaq<br>Sun<br>UV Networks                            | TaskSmart Web Server<br>Cobalt Qube; Cobalt RaQ<br>WebBox                                                           |

(which acquired appliance market leader Cobalt), and Toshiba, plus other reputable vendors such as WatchGuard and SonicWALL that specialize in this category. You can purchase server appliances for many different applications—including dedicated Web servers, cache servers, load balancers, file servers, print servers, firewalls, e-mail servers, fax servers, virtual private networking (VPN) servers—as well as a variety of network sizes.

While they function as file servers, some of the best-selling server appliances are actually called network attached storage (NAS) devices, because they provide a way to add file storage to the network very quickly. NAS devices are also very flexible, since their stripped-down file-serving software can serve files to a number of client operating systems, including various flavors of Windows and UNIX.

Server appliances generally can be divided into two categories: single-function devices, like a firewall, cache server, or NAS; and multifunction devices, which are meant to provide a complete solution for a small business or branch office. The latter are typified by the Cobalt Qube line, and often include several related Internet-based functions such as a router, Web server, firewall, and VPN capabilities. Rack-mount appliances are also available, which provide a way for hosting services or other datacenters to pack many more servers into a single room than they could with typical pedestal-style servers. The Sun Cobalt RaQ line is typical of this genre.

Be aware that in most cases you'll sacrifice flexibility, expandability, and scalability in return for a server that's incredibly easy to install and manage and very reliable. You won't have the flexibility to add applications or consolidate existing applications into

a single device. For those tasks, a general-purpose server makes a lot more sense.

## Freestanding, Rack-Mount, or Blade Server

In the beginning, there were freestanding servers, the typical tower configurations that were spread across companies to serve individual workgroups and departments or sat in the closet of a small business. Freestanding servers are still used in these types of environments and in many server rooms, but as more enterprises consolidate servers into large, carefully managed, environmentally controlled datacenters, or use collocation facilities, space starts to become a major constraint and expense. If you fit any of the descriptions below, you're a definite candidate for the rack-mount or blade-server paradigm:

- Your server room is currently bursting at the seams with freestanding servers.
- You're an enterprise or service provider looking to simplify billing, chargeback, and customer service functions by purchasing large numbers of low-cost servers, each dedicated to a single account.
- You're looking to scale out your Web or application server applications by fronting large farms of low-cost servers with load balancers.

A rack-mount configuration works just as it sounds. Specially designed rack-mountable servers are stacked on top of each other like stereo components in standard-size rack enclosures that have numerous features to simplify access, organize the cabling, and dissipate the heat that can build up quickly in such a configuration. A typical rack holds servers that are 19 inches wide. Server and rack height are measured in standard units (U) with 1U equaling 1.75 inches. Common rack-mount server heights are 1U, 2U, 3U, 4U, and 8U, with densely packed 1U servers all the rage in environments that are rapidly scaling out. Common rack enclosure heights are 25, 33, and 41 or 42U high, although other sizes are available.

Rack-mount configurations are a great way to fit many servers into a small space, and you can find both general-purpose and appliance servers to fit into those racks. The latest rage is the 1U-high rack-mounted server, which contains a considerable amount of power and hardware in its 1.75-inch-high case, including one or two processors, a couple of PCI or PCI-X expansion slots, and up to three hard drives. That means you can ideally stack up to 42 of them in a single rack, a great way to scale out in a minimum amount of space. You can also find rack-mount appliance servers, such as Sun's Cobalt RaQ. ISPs love these appliances as they can very quickly add individual servers as they add accounts and pack them in like sardines.

There's a brand-new type of server that allows you to fit even more systems into a smaller space than you can with rack-mount servers, and it's called the blade server. Blade-server modules contain CPUs, chip sets, memory, and sometimes a small amount of storage; and sit vertically in a rack-mounted chassis with many other blade servers, like books on a bookshelf. Instead of each server having its own network connection, power supply, and cabling, blade servers all connect to a single, shared high-speed backplane that takes them to a shared source of power, cooling, and network access, the latter typically Gigabit Ethernet. In some cases blade servers include some storage, but storage is generally provided externally via a separate RAID tower, storage area network (SAN), or NAS solution.

The blade server market is in its infancy, with a number of startups and a few first tries by mainstream vendors such as HP and Compaq. As such, there are many different configurations out there and a number of competing architectures with few established standards. For example, HP's blade-server backplane architecture is based on Compact PCI and the Network Equipment Building Standard (NEBS) used by the telecommunications market; while Compaq's architecture is based on Ethernet and IP. A new standard interconnect called InfiniBand holds great promise as the blade-server backplane standard of the future.

Vertically standing blade servers can be anywhere from 2U to 13U high, and a half or full rack deep. But at their smallest, you can theoretically house up to 336 1U-high blade servers into a 42U rack. The high-speed backplane and shared power, cooling, and Ethernet greatly simplify cable management and reduce power costs and management hassles. In fact, many of today's blade-server products use low-powered processors from Intel and Transmeta to reduce power consumption and heat buildup even further.

Blade servers also have scalability and availability advantages. Most blade-server configurations allow you to replace failed blades or add new blades in minutes without having to shut down the rest of the system. Management software which automates the reinstallation of original applications is offered by most blade server manufacturers. You can also expect to find dedicated blade-server appliances that can be plugged in and configured in minutes.

Another trend riding on top of blade servers is CPU provisioning, which allows you to allocate blade-server CPU power to applications in a much more flexible way than in the past, much the way SANs and their storage virtualization software can easily allocate and reallocate storage to applications. This will be invaluable for applications such as e-commerce or messaging that may have highly variable loads.

Rack-mount and blade servers are great solutions for space-starved datacenters. But if all you need is a few general-purpose servers, you'll spend a lot less for a freestanding configuration. While rack-mount vendors are doing everything they can to make serviceability better, the fact is that they are also trying to pack as much stuff into as small an amount of space as possible. This makes rack-mount servers inherently more difficult to service than most freestanding servers,

which give you more room to work.

Blade servers and 1U rack-mount devices are great solutions for scaling out applications, but they generally lack the expansion capability to scale up as effectively as 4U or 8U rack-mount servers or freestanding models. Individual rack-mount servers have redundancy and other reliability features, but reliability and availability in a rack-mount environment is often provided by scaling out features such as load balancing and parallel processing. Finally, any configuration that requires managing many densely packed servers as opposed to a few freestanding servers is inherently a bigger management and usability challenge.

## Platform Considerations

There are many different server processing platforms out there, but for most small and medium-



sized networks, the choices generally boil down to the Intel platform and a variety of RISC platforms offered by Compaq, HP, IBM, Sun, and others. Intel still dominates the small and medium business server market due to its standardization, familiarity, low cost, and its marriage to widely used operating systems like NetWare, Windows NT, and Windows 2000. You can also run many flavors of UNIX on Intel hardware, including most versions of Solaris as well as Linux. RISC platforms, on the other hand, are generally married to some flavor of UNIX.

The Windows/Intel platform has been working itself up the food chain in the last five years from small and medium-sized

network file services and applications to the enterprise. The RISC/UNIX platform has specialized in enterprise and Internet applications, and is currently working its way down into the small and medium-sized business market which, in the age of e-businesses, is increasingly running mission-critical applications that require the same performance, reliability, availability, and scalability. If you fit the latter category, you should definitely consider a UNIX or RISC server solution for your crucial applications. You may also want to consider Intel's Itanium, a relatively new 64-bit hardware platform that competes with RISC.

Until recently, RISC has been alone in offering a 64-bit architecture, which allows

it to address the large chunks of memory (64GB and up) that can dramatically speed up power-hungry e-business applications such as large-scale databases, online transaction processing, SSL encryption, and data mining. Combined with various flavors of UNIX such as Compaq Tru64, HP-UX, IBM AIX, or Sun Solaris, these platforms provide enterprise-class scalability, reliability, and performance.

Sun in particular offers tremendous scalability and reliability on its platform, with features like:

- The ability to **support up to 128 processors**, or 256 in a clustering configuration.
- **Live Upgrade**, which lets you upgrade the operating environment image while the system is running a full application load.
- **Hot patching**, which lets you add, remove, or change hardware components without shutting down the entire system.

- **Dynamic System Domains**, which let you partition a single Solaris server into multiple isolated application environments with their own reserved processors and memory, while retaining the ability to reallocate resources on the fly without rebooting.

The Intel/Windows platform is steadily improving its reliability features, offering support for up to 32 processors as well as preemptive multitasking, multithreading, load balancing, and high-availability clustering. UNIX, however, has a 30-year history of running enterprise and Internet applications that serve thousands or even millions of users with fast performance and top-notch reliability. UNIX also supported industrial-strength multitasking, multithreading, and TCP/IP networking long before Windows. The good news is that UNIX isn't the user-unfriendly command-line-only nightmare that it once was: most versions of UNIX now have graphical user interfaces available, based on X Windows and Motif.

For organizations taking their first leap into UNIX, Linux is a great way to start, as it's virtually free, runs on both RISC and Intel platforms, and provides most of the advantages of other flavors of UNIX. Linux has quickly evolved into a mainstream platform that's well-supported by server vendors including Compaq, HP, and, in particular, IBM. Many database, ERP (enterprise resource planning), Internet, and other corporate applications run on Linux, including Oracle and SAP, as do many powerful open-source applications. Well-known organizations such as Harvard University, Kinko's, and NASA have built a significant portion of their Internet and intranet infrastructures on Linux. Another option to consider is the Macintosh platform and its Mac OS X operating system, which marries the Mac's great user interface with an industrial-strength version of UNIX.

Today, the RISC/UNIX platforms can't lay exclusive claim to 64-bit processor architecture anymore, with Intel's release of the Itanium platform. Itanium is in the early stages, but it has some great performance and compatibility features, including:

- The EPIC (Explicitly Parallel Instruction Computing) architecture, which offloads the burden of arranging instructions for execution onto the compiler, and can execute 20 instructions per cycle.
- New instructions specifically geared towards speeding up encryption and securing transactions for VPN and SSL Web services.
- 128 registers dedicated to floating-point performance for scientific, engineering, and content-creation applications.
- A three-level caching architecture that greatly reduces memory latency.
- The potential to scale individual systems to 512 processors.
- A backward-compatibility feature with Intel's traditional 32-bit architecture.

Compaq and HP have already announced plans to transition their RISC platforms to Itanium eventually. Intel's next Itanium chip, due later this year (code-named McKinley), promises more performance enhancements. Many application vendors are waiting for McKinley to tailor their apps to the strengths of Itanium. Itanium should be considered for large-scale databases, online transaction processing, secure Web servers, financial simulation, and scientific and engineering applications.

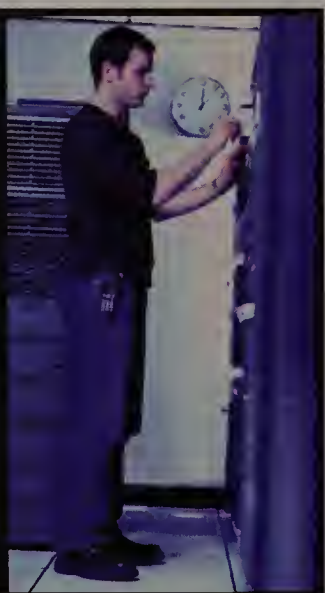
## ● Server Configurations

So which server is right for you? Below are some ballpark configurations to consider.

### The small business server

Let's say you're looking for a server for a small business, workgroup, or branch office of anywhere from 25 to 100 or so users. You need it mostly to handle simple file and print sharing, with some e-mail, and perhaps even a small Web server. Or you may want it to run a firewall and VPN. You don't want to spend a lot of money, but you want some room for growth.

You basically have two viable options. If ease of use or remote configuration and management are your prime concerns,



## • SERVERS • SERVERS • SERVERS • SERVERS • SERVERS •

consider purchasing a server appliance. Otherwise, you can opt for an freestanding, entry-level general-purpose server from Compaq, Hewlett-Packard, IBM, or other vendor. Look for a 1GHz Pentium III processor, with an empty slot for a second CPU should you need to scale processing power in the future.

Depending on how many users you intend to serve and which applications you'll be running, you'll likely purchase anywhere from 128MB of RAM to around 1.5GB, but you'll want system memory to be able to scale to 2GB—or even 4GB if you can afford it. The most common type of server memory today is ECC (error-correcting code) SDRAM, which can actually detect and correct certain memory errors on the fly. For fast storage I/O, you'll want an integrated Ultra 2 or higher SCSI adapter with 10,000 rpm SCSI hard drives, though you can consider less-expensive Ultra-ATA drives in this category if you're on a budget. You should look for at least a 250-watt power supply.

For expandability, look for three to five PCI slots with one or two 64-bit slots for high-performance adapter cards, as well as five or more shelves for adding storage and backup devices. Look for tool-free cases for ease of serviceability, plenty of room to work, and utilities that ease setup and configuration. You'll want some form of performance monitoring and prefailure notification, as well as the option for dial-in, out-of-band remote management and server restart in case the network or power fails. Some vendors even offer their own remote-monitoring service for your systems.

### The departmental server

Now take a step up and assume you're a small-to-medium-sized business or a department with over 100 employees running additional applications like databases and remote access, and you need a little more performance and reliability features. Again, you should investigate the appliance alternative. Otherwise, consider a single or dual-processor 1.26GHz Pentium III processor (or faster) server to run your applications. Step up to processors with

512K cache memory, and system memory expandability to 4GB or 6GB.

For higher availability, you'll want to look for redundant fans and power supplies (both of which may be hot swappable depending on the server you choose), which means that in the event of failure, you can swap one part out and add another in without shutting down the server. Look for hot-pluggable 64-bit PCI slots (meaning you can swap out failed adapter cards without shutting the server down), and a dual-channel Ultra 2 or 3 SCSI controller or a RAID adapter. You may find more extensive management capabilities with this class of server as well, which may include more types of alerts and integration with higher-level management packages like HP's OpenView.

### The application server

Take it up another notch, and you'll be at the application server level, which needs even more power and reliability features for things like large databases, e-mail, or ERP applications. First decide whether you want a freestanding server, or if your space constraints cry out for a rack-mount configuration. Look for up to four-CPU Pentium III Xeon, Xeon, or Xeon MP systems, since these processors have larger and faster Level 2 caches (and an additional Level 3 cache in the Xeon MP), and provide more power and scaling capabilities. Xeon and Xeon MP processors use Intel's NetBurst architecture, a very fast 400MHz system bus, and a new Hyper-Threading technology that lets multiple application threads execute on a single processor. All of these features can greatly enhance application performance.

Look for features like dual-channel Ultra 160 or Ultra 320 SCSI or a RAID 5 controller; as well as hot-swappable power supplies, fans, and network interface cards. In a freestanding model you'll want up to eight PCI slots with at least two 64-bit 66MHz slots, and perhaps a few more 64-bit 33MHz slots. Also consider PCI-X, a newer PCI standard that can

take a heavier expansion load and provide better performance. This is important if you'll be attaching to one or more Fibre Channel SANs in addition to Fast or Gigabit Ethernet.

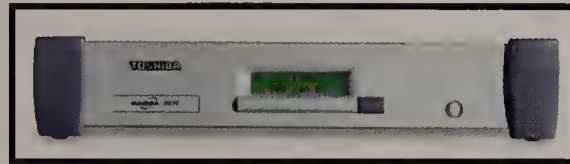
You'll almost definitely want out-of-band remote management, prefailure notification, and a feature called automatic recovery, which restarts the server automatically in the event of a server failure. You may be interested in a clustering solution, which automatically fails over an application to another server when the first one fails.

### The enterprise server

Finally, an enterprise datacenter server for business-critical applications pulls out all the stops, with eight or more processors, memory up to 16GB, PCI-X, and hot-plug redundant everything, including RAID controllers. You're more than likely attach these servers to a high-powered Fibre Channel SAN. Look for out-of-band remote management, prefailure notification, integration with top management packages, clustering in some cases, and just about every other reliability and availability feature you can get.

For application and enterprise server needs, you should investigate RISC/UNIX systems, as well as Itanium for applications that need 64-bit addressability, great floating point performance, and/or fast encryption. You'll also want to consider a high-availability clustering configuration. For datacenter applications that are appropriate for scaling out instead of scaling up, look at the alternative of purchasing many 1U or 2U rack-mount servers, or even blade servers if you really need the scaling and space they provide.

No matter what your environment or application, there's a server available from top-flight vendors such as Compaq, IBM, HP, and Sun. Carefully consider the "ilities," the available server architectures, and your performance requirements, and you'll find the exact server to fit your needs.





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# search engines

**Want unbiased, accurate results?** Choose your search site carefully. From the big guys to the undiscovered gems, we find the sites you can trust.

BY LAURIANNE McLAUGHLIN

Let's say you're interested in digital cameras. So you search for exactly that—"digital cameras"—on MSN ([search.msn.com](http://search.msn.com)). But when the results come back, you find yourself saying, "What is all this stuff?" One set of matches at the top of the page is called Featured Sites. Below that is a set of links labeled Sponsored Sites. Below those is still another group called Web Directory Sites.

So what's going on? Many of these results are links that advertisers have paid MSN to put in front of you, and many others are links to sites that haven't paid a dime but that provide good information on digital cameras. Which ones are which? Even if you study MSN's explanatory boxes closely, you can't know for sure.

Featured Sites, according to MSN, are a mix of Web pages from three sources: advertisers who have paid to be there; other sites that, like MSN, are owned by Microsoft; and sites that are just plain useful. MSN doesn't identify which links come from which category. Sponsored Sites consist entirely of spots paid for by advertisers. Once you get to Web Directory Sites you might think, "Finally—I'm past the ads and down to the links that will help me." Not so fast. The first link, labeled "10 Most Popular Sites for Digital Cameras," leads you to a page ►

# 'So many Web searches have been hijacked by advertisers.'

—Gary Ruskin, *Commercial Alert*

from Ask Jeeves ([www.askjeeves.com](http://www.askjeeves.com)). The first ten spots on that results page are also bought and paid for. Talk about an overwhelming response—and a lot of confusion.

The fact that search engines have put parts of their results pages up for sale can shake your trust in these gateways to the Internet. But it starts to get even more troubling when you examine the listings themselves. We believe that some sites alter the “real results.” (Note: In this story, we use the term *real results* to refer to search engines’ main body of listings that—in theory—advertisers don’t pay for in any way.) Plus, some observers are concerned that small sites and nonprofit groups might get bumped off the listings altogether because they can’t afford to pay to be included.

We went behind the scenes to find out how search sites operate. We put the engines through their paces and found that while some sites clearly label paid links, others, like MSN, do a poor job. We also suspect that some sites adjust the results to improve their corporate bottom line—the sites deny this, however. And even though it’s becoming more common for companies to pay search engines a fee in return for cataloging their Web pages,

small sites and nonprofit groups aren’t going to be left in the dust anytime soon. But the practice could pose a future threat.

Despite our misgivings, the situation is not completely hopeless. There’s always Google ([www.google.com](http://www.google.com)). Not only does Google deliver exceptionally relevant matches, it’s also the best of the bunch at identifying ads. In fact, we like Google so much, we gave it two awards this year. Turn to “PC World’s 20th World Class Awards” on page 82 to read Google’s accolades.

In this article, we’ve got the best advice on how to decipher the search results at major sites. We also offer some handy search tricks (see “Super Search Tips” on page 124). On top of that, we’ve discovered some useful sites you may not have stumbled on before (turn to “Sites for Special Searches” on page 118).

## AVALANCHE OF ADVERTISERS

THE WAY THAT SEARCH SITES currently handle sponsored links has caught the attention of Commercial Alert, a consumer group founded by Ralph Nader. The organization filed a complaint last July with the Federal Trade Commission alleging that

### REPORT CARD

## the truth behind web search results

Google and Yahoo clearly identify advertisers’ links; AltaVista and MetaCrawler don’t. Here’s the lowdown.

| SITE                                                                        | Search technology                                                                | Clarity of labeling (word score) | Paid inclusion <sup>1</sup> | Comments                                                                                                                                                                |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AltaVista<br><a href="http://www.altavista.com">www.altavista.com</a>       | Own search engine.                                                               | Poor                             | ●                           | “Products and Services” paid links section doesn’t clearly identify the links as ads. Also, site delivers lots of annoying “pop-under” ads during searches.             |
| AOL<br><a href="http://www.aol.com">www.aol.com</a>                         | Inktomi search engine; AOL modifies the results for inappropriate material.      | Good                             | ●                           | “Sponsored links” label is clear, along with the tagline “Provided by a third party and not endorsed by AOL.” But you get plenty of flashing, distracting banner ads.   |
| Ask Jeeves<br><a href="http://www.askjeeves.com">www.askjeeves.com</a>      | Own search engine (now owns Teoma).                                              | Good                             | ●                           | “Featured listing” link looks like an ad; “Sponsored links” label stands out but has no explanation. Delivers lots of annoying pop-under ads.                           |
| Google<br><a href="http://www.google.com">www.google.com</a>                | Own search engine.                                                               | Excellent                        | ○                           | Does a great job all round: Clear Sponsored Link labels, bold fonts, and the page design all help to distinguish between paid and unpaid links.                         |
| Lycos<br><a href="http://www.lycos.com">www.lycos.com</a>                   | FAST’s search engine.                                                            | Average                          | ●                           | “Sponsored search listings” label is clear, but it’s a little hard to read. “Start here” link is confusing; it leads you to advertisers. Company may discontinue it.    |
| MetaCrawler<br><a href="http://www.metacrawler.com">www.metacrawler.com</a> | Combs multiple search engines and combines results on one page.                  | Poor                             | ●                           | Featured Search Results label on paid links is quite confusing; “MetaCrawler suggests” ad contained within the search results list often delivers unrelated paid links. |
| MSN<br><a href="http://www.msn.com">www.msn.com</a>                         | Both LookSmart and Inktomi search engines; employs its own ranking formula.      | Average                          | ●                           | Handy buttons explain Featured Sites and Sponsored Sites. Still, we’d like a way to find out which results inside Featured Sites are paid for.                          |
| Yahoo<br><a href="http://www.yahoo.com">www.yahoo.com</a>                   | Editors review sites and categorize them; employs Google engine for full search. | Excellent                        | ●                           | Clearly separates its Sponsor Matches paid links from the unpaid ones. But Yahoo makes heavy use of banner ads.                                                         |

● = Yes ○ = No

<sup>1</sup> Search site charges companies to be more frequently or thoroughly catalogued.

major search sites disguise the links that are paid for. "So many Web searches have been hijacked by advertisers," says Gary Ruskin, Commercial Alert's executive director. "The FTC should require search sites to tell us when ads are ads." At press time, the FTC was still investigating the complaint.

According to recent survey results published by Consumer WebWatch, a group affiliated with the nonprofit organization Consumers Union, 60 percent of Internet users interviewed did not know that search sites take fees to list some Web sites more prominently than others. And 80 percent of these users felt that search engines should disclose advertising deals.

Not too long ago, Web searching was all about cool technology. Search sites competed fiercely for your clicks. Sites like Lycos ([www.lycos.com](http://www.lycos.com)) and AltaVista ([www.altavista.com](http://www.altavista.com)), for instance, vied for your attention by constantly updating their search tools. But the battle among search engines has slowed dramatically—at least where innovation is concerned.

The look and feel of each popular search site may still be different, but now a lot of sites are built on the same foundation. Rather than create their own unique search tools, some of the big search sites use technology by Inktomi to conduct searches. The search business is also more focused on making money. Without a profit, search sites won't be around. Banner ads haven't been as lucrative as the sites had hoped, so the search sites are now acting more like the Yellow Pages: They're doing their best to match advertisers with potential shoppers.

## PAYING TO APPEAR AT THE TOP

HERE'S WHERE *paid placement* links enter the scene. These sponsored links show up along with the real results when you run a query on specific keywords. Lots of search sites have deals with Overture (formerly GoTo.com), a company that specializes in distributing sponsored search results. Overture-based links currently appear on results pages of nearly all major search sites, except Google. However, at the time of this writing, AOL announced it would not renew its contract with Overture. It will start to display ads purchased through Google this summer. To advertise on Overture's search engine partners, advertisers bid an amount they will pay per click when a searcher opens a sponsored link; the highest bidder wins top placement. Note: *PC World* participates in Overture's paid placement program and appears as an advertiser on Overture's network of search sites.

Earning money is fine—no one wants the search engines to go out of business. But as Nader's group insists, it's up to the sites to clearly identify ads. Some do not, and here lies the problem.

Each search site writes its own rules on how to label paid placement links. How can you tell which links are ads and which are not? On some sites it's easy, and on others it's anybody's guess.

There's no question about Google's ads. They don't look like regular listings. The ads are highlighted in a different color, and each is labeled as a sponsored link. They're always separate on the results page, appearing as shaded boxes to the side of the list-

ings or right at the top. (Full disclosure: *PC World* is an advertiser on Google and *PC World* pages appear as sponsored links.)

Most of the other search sites show their Overture-powered results before the real results, usually at the top of the page. Yahoo ([www.yahoo.com](http://www.yahoo.com)) calls its paid listings Sponsor Matches, and the distinction is clear (even if the results page is a bit cluttered). The site presents you with shopping links first, fol- ▶

## can you spot the ads?

IT'S NOT ALWAYS easy to recognize paid links in the search engines' results. Google makes it obvious; MetaCrawler does not.

**GOOGLE** clearly sets its ads apart from other listings by highlighting the background in a different color.

IT'S EASY to spot the other batch of ads, thanks to the boxed format with shading.

OBVIOUSLY, the suggested link has nothing to do with our search query. Not only is the phrase "MetaCrawler Suggests" vague, but the site does not explain what the label means.

AT FIRST blush, you can't tell that Featured Search Results are paid ads.

lowed by Category Matches, and then Sponsor Matches. Yahoo provides some details about how its ad system works when you click the link "What are Sponsor Matches?" Lycos calls its ads Sponsored Search Listings, but the label, with its small gray font, doesn't exactly jump out at you, and there's no link to explain the term. Ask Jeeves also offers its "sponsored links" before its real results, but it doesn't spell out what the label means.

MSN, on the other hand, has decided that it's okay to mix paid and unpaid results in its top category, Featured Sites, and not tell you which is which. Click the adjacent *About* icon and a screen pops up to tell you that Featured Sites are picked by editors who strive to choose the most relevant paid and unpaid results. But you still can't tell which links are paid for and which are not.

At AltaVista, you see paid links in the top spot that are labeled Products and Services—not very revealing. When you click the label for an explanation, AltaVista first says that the sites have been reviewed by editors for relevancy to the search term, then identifies the listings as ads. "We feel like we're making it pretty clear," says AltaVista spokesperson Krista Thomas.

Critics like Danny Sullivan, editor of UK-based SearchEngine-

Watch.com, believe that labels like AltaVista's are misleading. "I think 'sponsored' should become an industry-standard label for paid links," says Sullivan. "People want to know what sponsored links are. It doesn't mean they won't use them."

## THUMBS-DOWN ON METASEARCHES

MANY METASEARCH SITES—sites that combine results from several search sources in one results screen—do the worst job of labeling paid links, Sullivan says. "People assume metasearch engines are delivering the best editorial goods. The reality is, they query paid listings, so they become meta-yellow pages," he says.

For instance, MetaCrawler ([www.metacrawler.com](http://www.metacrawler.com)) calls upon search engines such as AltaVista and other sites like Sprinks ([www.sprinks.com](http://www.sprinks.com)), which are full of paid placements. For most queries at MetaCrawler, the top category in the listings is peppered with paid links, mysteriously labeled Featured Search Results. You also see a sponsored link called MetaCrawler Suggests that often presents completely irrelevant links. For example, when we ran a query on the term "802.11b spec-



## SEARCH GEMS

# sites for special searches

THESE 21 specialty (and less-well-known) search sites are strong alternatives to the big guys. They let you focus your searches on specific topics.

### BoardReader

[www.boardreader.com](http://www.boardreader.com)

**Message board central.** Find postings from all over the Web on topics such as arts and antiques, computers, outdoor recreation, sports, and travel.

### CompInfo

[www.compinfo-center.com](http://www.compinfo-center.com)

**Truly nerdy tech specs.** When you need details on a technology or a component down to the geek level, search here and you'll get plenty of info.

### CompletePlanet

[www.completeplanet.com](http://www.completeplanet.com)

**Deep links.** The site says that its public directory gives you

access to over 100,000 databases and search engines.

### Digital Librarian

[find.pcworld.com/28001](http://find.pcworld.com/28001)

**A librarian's eyes.** Here you'll get a librarian's view of the best links for both mainstream and offbeat research. It's also useful for academic topics.

### Dmoz

[dmoz.org](http://dmoz.org)

**Completely commercial-free.** This volunteer-led directory categorizes sites in much the way that Yahoo's directory does, but without all the sponsored links and banner ads.

### GPO Access

[find.pcworld.com/27641](http://find.pcworld.com/27641)

**Gov granddaddy.** This catalog of U.S. government publications might overwhelm you with information. The Web site

has copies of all federal agency reports from 1994.

### The Invisible Web Directory

[www.invisible-web.net](http://www.invisible-web.net)

**Public records sleuth.** This site delivers URLs for some off-the-beaten-path databases of public records. It covers a range of areas such as business, legal, medical, technical, and other specialized data.

### Ittools

[www.itools.com](http://www.itools.com)

**Word wizard.** You get to search among research topics and language tools at this site. You can try the translating tools for 15 languages, legal dictionaries, a computing terms dictionary, and even a thesaurus tool that can help you solve crossword puzzles.

### Ixquick

[www.ixquick.com](http://www.ixquick.com)

### Metasearch master.

Carry out metasearches using combinations of popular sites that you pick and choose. You can search the Web, MP3s, news, and pictures—and avoid the paid sites that most other metasearch tools favor.

### Lasoo

[www.lasoo.com](http://www.lasoo.com)

**Find and map it.** Run queries for hotels, auto shops, and other businesses anywhere in the world and watch a map pop up displaying the locale.

### MagPortal.com

[www.magportal.com](http://www.magportal.com)

**Magazine mania.** You can search through a huge archive

# Even computer scientists can't prove or disprove whether **funny business** goes on.

ifications," the MetaCrawler Suggests ad pointed to "Dating & Romance for over 30s"—a link to Udate.com, a matchmaking site. *Hello?* Relevancy, in this case, had gone out the window.

MetaCrawler's paid links are supposed to be relevant to the search at hand, says Steve Stratz, senior public relations manager at InfoSpace. (InfoSpace's technology powers the searches at Excite, WebCrawler, and MetaCrawler.) However, in recent months, the ad spots have been filled by the company's big network advertisers and they often appear on multiple sites, reports Stratz. InfoSpace recently launched its new metasearch product at Excite and WebCrawler. The company hasn't decided whether these changes will roll out on MetaCrawler.

Unless you really want to pore through tons of ads, we recommend that you kick off your Web searching anywhere but metasearch sites. Try Google or Yahoo. However, if you like the

fact that metasearch sites scour numerous engines at once, check out Ixquick ([www.ixquick.com](http://www.ixquick.com)), a different kind of metasearch site that forgoes the slew of ads (see additional information about Ixquick in "Sites for Special Searches" below).

## RIGGED RESULTS?

PAID LINKS THAT AREN'T CLEARLY LABELED are bad enough, but at some sites, *PC World* found evidence that you can't always trust the real results. In some cases, results at AOL ([www.aol.com](http://www.aol.com)) and MSN seem to serve the companies' corporate needs as much as searchers' interests. (Note: *PC World* regularly provides content for AOL's Computer Center channel.)

In our tests, we found that some portal sites plug their own products and services every chance they get. For example, when we searched for "travel" on AOL and on MSN, the compa- ►

for specific magazine articles, or browse topics like "small business" or "recruiting."

### Pandia Search Central

[www.pandia.com](http://www.pandia.com)

**Search on search.** This site offers useful lists of search engines and directories that handle queries on images, news, shopping, online radio, discussion groups, and more.

### Researchville

[www.researchville.com](http://www.researchville.com)

**News in context.** This one-stop shop lets you search breaking news from wire services and newspapers. You can also tap into research sites for medical, education, and government topics.

### Search Engine Colossus

[find.pcworld.com/28261](http://find.pcworld.com/28261)

**Going global.** Here you'll find links to regional search engines in 196 countries (and counting). You can search by

topic, as well—art, Buddhism, kids, music, and wine are a few.

### Singingfish

[www.singingfish.com](http://www.singingfish.com)

**Multimedia jackpot.** Search international sources for audio and video clips, news stories, and more. Where else will you find the *Moulin Rouge* soundtrack in different languages on the first try?

### Statistical Resources on the Web

[find.pcworld.com/27642](http://find.pcworld.com/27642)

**Stats in a sec.** The site gives you a quick way to search for everything from A to, er, W. Hunt for statistics on everything from aging and ancestry to watersheds and wildlife.

### Switchboard.com

[www.switchboard.com](http://www.switchboard.com)

**People and places.** Want to call the plumber you used in

the next town over, but can't remember the name of his business? Search here for "plumber" by town name.

### Teldir.com

[www.teldir.com](http://www.teldir.com)

**International people and places.** Here you'll find links to Yellow Pages, White Pages, e-mail addresses, and fax numbers from more than 170 countries around the world.



### Vivisimo

[www.vivisimo.com](http://www.vivisimo.com)

**Hooked on organization.** This unusual, ad-free, and highly useful search tool queries multiple search sites and organizes the results by type of document—message boards, maps, or images, for example—not just by site name.

### Vroosh

[www.vroosh.com](http://www.vroosh.com)

**MP3s and more.** This Canadian metasearch site lets you search news topics, online auctions, MP3s, and books. You can use its friendly MP3 search tool without viewing any music ads.

### Xrefer

[www.xrefer.com](http://www.xrefer.com)

**Bit o' Brit.** This British site gives you everything from art history facts to academic topics to music terms to famous quotations, using a collection of reference books.

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### Desktop Solutions

#### Evo D500 Minitower with Compaq S7500 17" Monitor\* (16" viewable)

Intel® Pentium® 4 processor 1.80GHz  
 128MB PC133 SDRAM  
 20GB² Hard Drive  
 48X Max³ CD-ROM Drive  
 nVIDIA Vanta 16MB 4X AGP Graphics Card  
 Embedded Intel® PRO/100 NIC  
 Microsoft® Windows® XP Professional/  
 Microsoft® Windows® 2000 – dual install⁴  
 3-years parts and labor with 3-year next-business-day on-site warranty⁵

**\$999** Lease for  
**\$28/mo.¹**

#### Evo D500 Small Form Factor with Compaq S7500 17" Monitor\* (16" viewable)

Intel® Pentium® 4 processor 1.80GHz  
 128MB PC133 SDRAM  
 20GB² Hard Drive  
 48X Max³ CD-ROM Drive  
 nVIDIA Vanta 16MB 4X AGP Graphics Card  
 Embedded Intel® PRO/100 NIC  
 Microsoft® Windows® XP Professional/  
 Microsoft® Windows® 2000 – dual install⁴  
 3-years parts and labor with 3-year next-business-day on-site warranty⁵

**\$999** Lease for  
**\$28/mo.¹**



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 56K V.92 Modem⁶  
 10/100 NIC  
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**Includes:**  
*iPAQ 3850 Pocket PC with Microsoft® Pocket PC 2002 operating system*  
 Carrying case

**\$1849** Lease for  
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 128MB SDRAM  
 20GB² Hard Drive  
 DVD-ROM Drive  
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 56K V.92 Modem⁶  
 10/100 NIC  
 Microsoft® Windows® XP Professional/  
 Microsoft® Windows® 2000 – dual install⁴  
 3-year Limited Worldwide Warranty⁵  
**Includes:**  
*iPAQ 3850 Pocket PC with Microsoft® Pocket PC 2002 operating system*  
 Carrying case

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 18GB² Pluggable Ultra3 SCSI Hard Drive  
 Integrated Dual Channel Wide-Ultra3 SCSI Adapter  
 High-speed IDE CD-ROM Drive  
 1.44MB Floppy Disk Drive  
 Compaq NC3163 Fast Ethernet NIC 10/100 TX UTP  
**Includes SmartStart and Compaq Insight Manager**  
**Microsoft® Windows® 2000 Server operating system preinstalled (5-user license)**  
 1-year Limited Warranty⁵

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### Options

#### HP Deskjet 940c color inkjet printer

**\$149**

Photo-quality printing up to 2400 x 1200 dpi. Creative projects are a snap with print speeds of up to 12 ppm in black and 10 ppm in color. Includes easy-to-use photo software.

#### Compaq iPAQ Pocket PC Accessory Kit

**\$59⁹⁹**

Everything you need for the mobile road warrior. The kit includes: Mobile Sync/Charging USB cable and cigarette lighter adapter, Belkin 4-in-1 Stylus Pen, 12 Screen Overlay Protectors, PDA Cleaning Kit, Handango Pocket Informant Software.

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Windows XP Professional and Microsoft Windows 2000. If end-user desires the rejected product after selection is made, end-user must acquire and pay for the rejected product separately. \*Certain restrictions and exclusions may apply. For complete warranty details, consult the Compaq Product Information Center, 1-800-345-1518 (U.S.). \*ITU V.90/V.92 modems are designed only to allow faster downloads from K56flex or V.90/V.92 compliant digital sources. Maximum achievable download transmission rates are currently unknown, may not reach 56 Kbps, and will vary with line conditions. © 2002 Compaq Information Technologies Group, L.P. Compaq, the Compaq logo, Evo, ProLiant, SmartStart, Compaq Insight Manager and iPAQ are trademarks of Compaq Information Technologies Group, L.P., in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. Intel, the Intel Inside logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other products mentioned herein may be trademarks or registered trademarks of their respective companies. Compaq is not liable for editorial, pictorial or typographical errors in this advertisement.

nies ranked their own affiliated e-commerce sites high on the first page. Though you might expect such listings in the sponsored links, we noticed the phenomenon in the real results as well.

When you run a search for "travel" on AOL, four of the first ten results that AOL delivers are affiliated with AOL—the number one recommended site is AOL Travel. AOL ranks Expedia, Microsoft's travel site, at number 14. Plug the same keyword into MSN's search field and you'll find no mention of any AOL travel sites within the first 50 results. But Expedia appears in the top spot in two categories, Featured Sites and Sponsored Sites (go to [find.pcworld.com/27142](http://find.pcworld.com/27142) for more details). Expedia is the second-most-visited travel site on the Web, and AOL Travel is number seven, according to recent statistics from the research firm Jupiter Media Metrix.

Why are results so different on the two portals? It's hard to find an innocent explanation. AOL and MSN both use Inktomi's technology for searches. MSN also uses Overture-powered sponsored links. When we carried out our search tests, AOL was still using Overture's technology.

Inktomi and Overture say that their customers can manipulate results and prevent competitors' sites from showing up. But both AOL and MSN deny manipulating Inktomi's search results. Neither company, though, could explain how they produce different results for identical searches.

"Every AOL search [result] features the most relevant content for AOL users, whether it is a partner or nonpartner site," says AOL spokesperson Andrew Weinstein. With the search results that MSN generates, "everything is editorially managed," says Brian Gluth, MSN senior product manager. "It's all relevancy."

#### NOT ALWAYS COMMERCIAL-FREE

AOL AND MSN AREN'T the only sites where commercial interests seem to affect the real results. Try using MetaCrawler to search for a topic like "Abraham Lincoln." Even once we'd looked past the paid links, we were presented with a remarkable list of links to sites selling Lincoln T-shirts, vases, and other memorabilia. Of the first ten real results, only three weren't trying to sell us something. And when we ran a search for "digital cameras" on MetaCrawler, the last handful of links appearing on each page were identical—all pointing to shopping sites.

InfoSpace's Steve Stratz says MetaCrawler has no policy to place commercial sites above real results. "The search providers on MetaCrawler currently are heavy on the paid side," says Stratz. "We are working hard to even this out by partnering with pure search providers." Stratz points to recent agreements with



Danny Sullivan, editor of  
SearchEngineWatch.com.

## 'Metasearch sites become meta-yellow pages.'

Ask Jeeves, FAST, and LookSmart. Search engine AllTheWeb ([www.alltheweb.com](http://www.alltheweb.com)) is based on FAST's search technology.

Even computer scientists can't prove or disprove whether funny business goes on within relevancy rankings. "Many search engines really don't publish reliable scientific information about the quality of their results," says Amanda Spink, an associate professor of information sciences and technology at Pennsylvania State University who recently completed a five-year study of the search habits of Excite users. "Most search sites don't like to give out this kind of competitive information," she adds.

Search companies provided only basic information about how they rank results. Google employs a complex algorithm, or mathematical formula, to rank pages. Yahoo employs a team of editors to create useful categories of Web sites that they've reviewed for inclusion in the directory. Beyond that, however, search sites refuse to explain the ins and outs of their formulas.

Spink's study showed that about 70 percent of people don't scroll beyond the first or second page of search results. That

could prove troublesome if results pages become front-loaded with sponsors or *paid inclusion* listings—links that Web site owners pay a yearly fee to have included in a search engine's results.

## PAYING TO BE SEEN

A SITE OWNER WHO PAYS A SEARCH ENGINE to be included receives a guarantee that the site's pages will be frequently revisited (say, every couple of days) by the search engine's *spider*—a tool that trolls the Web for new or updated pages. This scheme differs from paid placement, in which advertisers are guaranteed a top position in the results whenever someone searches on certain words. Paid inclusion sites pay to be looked at by the spider, but aren't guaranteed a spot at the top of the results. Sites that buy into Yahoo's plan fork over \$299 per year. Lycos customers pay \$18 per year, plus \$12 for every URL they submit.

Search companies promise that this payment feature won't fiddle with results. "This does not affect the relevancy ranking in any way, shape, or form," says Bryan Burdick, vice president of portal services for TerraLycos, the company that owns the Lycos search site. Lycos is another company that uses the FAST search engine technology. So, according to Lycos, users will see ranked results based on what the FAST formula decides is most relevant, regardless of who has paid to be included.

Google, however, says it firmly opposes paid inclusion. "The best thing for a search engine to do is crawl as many URLs as it can, as often as possible," says Google software engineer Matt Cutts. "Treating a smaller list of sites differently isn't fair."

Search industry veterans like Sullivan foresee possible problems down the road. "There is the potential for abuse," he says. "Pages that consumers want could be ignored by spiders."

Are certain types of nonprofit sites being left behind by search engines as paid inclusion becomes widespread? Not yet, Sullivan contends. "Search engines are probably realizing that they need to do a good job of picking nonprofit and research sites," he says. "They don't want to look bad." LookSmart, for instance, offers a special site, Zeal.com, that lets nonprofit organizations sign up for consideration for free.

## ARE ADS ALL BAD?

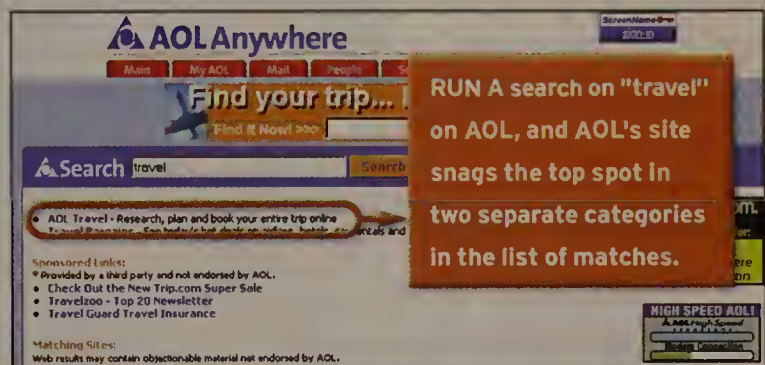
SPONSORED LINKS AND PAID INCLUSION practices aren't all gloom and doom for users. Ads can be useful, depending on what you're searching for. If you're shopping for something specific, sponsored links can often lead you to reputable e-commerce sites. For example, if you search for "Palm M130" on any of the major sites, you'll get links to several stores, and often to ads or sponsored links with the latest prices.

That said, the huge focus on commercialism can leave you feeling like the once cool and democratic Web is becoming too much like the Yellow Pages. But if you don't like the way that search sites are making money through paid placement and paid inclusion programs, then consider the alternatives. You might find them even more distasteful.

AltaVista now lets Web sites pay to add small graphics and tag lines to the search results for a company name or product. When we searched for "oatmeal" on AltaVista, for example, AltaVista ranked the Quaker Oatmeal site number one. We saw the familiar Quaker-man logo next to the listing. In this case, the food company paid to have its logo appear—it did not pay to appear at the top. Still, imagine if the whole results page became cluttered with logos and marketing spiels. ▶

## portals plug their sites

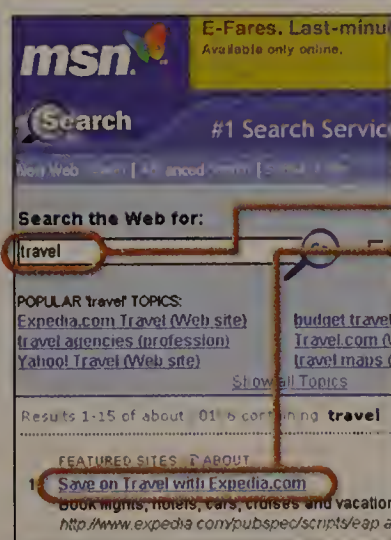
WHEN WE SEARCHED for "travel" on AOL and MSN, we found that these portal sites promote their own interests above others.



**RUN A search on "travel" on AOL, and AOL's site snags the top spot in two separate categories in the list of matches.**

**MICROSOFT'S site showed up at number 14 on AOL. Expedia regularly ranks in the top five travel sites.**

- I Travel Channel - Find out what's on and read interesting sites.  
<http://www.travelchannel.com/>
- maps by expedia.com travel maps.expedia.com  
<http://maps.expedia.com/>
- expedia  
<http://www.expedia.com/>
- Yahoo! Travel - Home - Yahoo! - Help Hello, Guest Cre  
<http://travel.yahoo.com/>



**TRY SEARCHING for "travel" on MSN Search and Expedia, the site owned by Microsoft, will appear in several groups at the top.**

- WEB DIRECTORY SITE  
Get the Top 10 Most Popular Sites for
- 5 Expedia.com  
Offers discount travel reservations on airfare, find new travel specials daily and guides to popular  
<http://www.expedia.com/>
  - 6 Travelocity.com - Airline Tickets & Hotels  
Source for discount travel opportunities. Book air, cruises, and flights from 700 airlines worldwide.  
<http://www.travelocity.com/>

**AOL's travel site, on the other hand, appears at number 60 in MSN's search results. AOL is often ranked within the top 10 most popular travel sites.**

- <http://www.hidingtravel.com/idx/idx.htm>
- 58 Hidden America  
Chronicles the diversity of America beyond the from the road  
<http://www.hiddenamerica.com/>
  - 59 Family Travel Forum  
Produces a regular newsletter about traveling some travel eemcae.  
<http://www.familytravelforum.com/>
  - 60 Everything's Travel  
A comprehensive travel resource on the Web. C  
<http://members.aol.com/etn/everything>
- Web Results  
Travel

# If you see labels on search sites like 'special results,' your antennae should go up.

Another alternative: Those increasingly aggressive pop-up, pop-under, and "floating" ads. Somill Hwang, a San Francisco public relations account executive, has a strong reaction to such bandwidth-intensive ads. Hwang, whose friends call her the office search engine guru, says she'll take sponsored links over pop-up ads any day. "If you don't want a sponsored link, you just glance past it," she says. Annoying ads are the quickest way for search companies to lose her loyalty.

Pundits like Danny Sullivan agree that paid links will stay around. But searchers should insist that these links be called "sponsored" links. If you see labels on search sites like "special results," "featured links," or other euphemisms, your antennae

should go up quickly. The good news is that you can still find results that haven't been paid for. We're impressed with Google and Yahoo, and the ways that they lead you to such listings. You can tune out the ads easily and zoom in on the links you want.

If a search engine doesn't clearly mark its ads, vote with your mouse. You wouldn't watch a TV channel that disguised infomercials as shows, and you wouldn't buy a magazine that allowed merchants to pay to be recommended in its articles. Why put up with confusion at search sites?

*Laurianne McLaughlin is a freelance writer based in Massachusetts. Tom Spring, a PC World senior reporter, also contributed to this article.*

## SEARCH HELP

### super search tips

SEEK AND YE SHALL FIND: We asked search experts for their best advice. Try out these top ten searching tricks.

#### 1 Play Favorites

If you choose two or three search sites to use most often, familiarize yourself with their advanced search rules. The more you use them, the better your results.

#### 2 Specify What You Want

When you're researching a product, for example, use a query that helps the search site know what you want. Try entering "Sony Mavica reviews" instead of just "Sony Mavica." The words "compare" and "buy" help, too.

#### 3 Quote Me

Putting quotation marks around a search phrase often works magic. For example, if you include quotation marks when you search for the histo-

rian "Studs Terkel," you will avoid getting listings for cufflinks or building materials.

#### 4 Be a Task Master

You can often locate what you want by entering a task into the search field. Try typing in "update my social security" or "File my taxes," say.

#### 5 Brush Up on Boolean

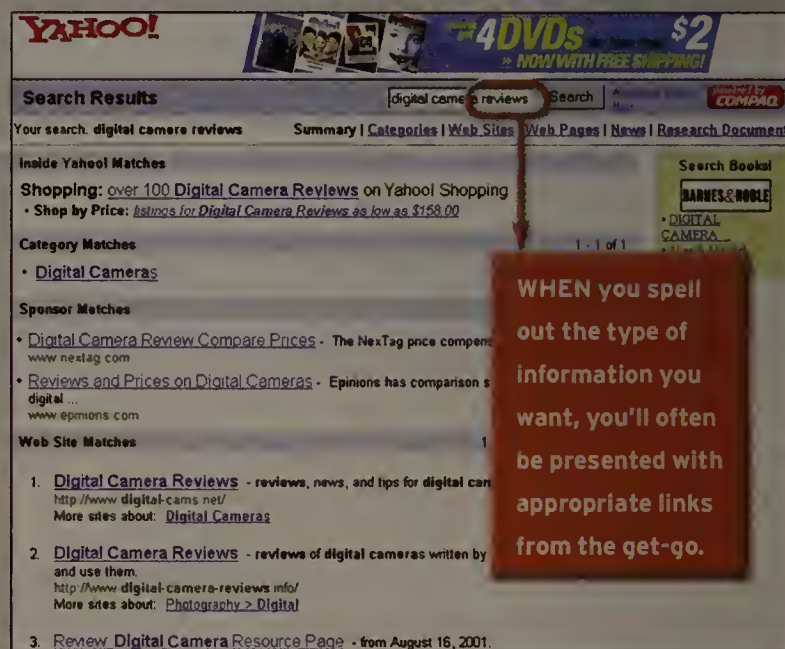
Try the Boolean command AND first, to see links with all search terms, as in *Intel AND memory*. Go to [find.pcworld.com/27321](http://find.pcworld.com/27321) for Danny Sullivan's Boolean tips.

#### 6 Make a Date

If you want links that relate to a particular time, include the date or year in quotation marks. Example: "Olympics and 2002."

#### 7 Learn Your Lingo

If you're searching for specialized material, make a



note of the specific phrases that others use in the field. For example, a fundraiser who often researches potential donors' biographies tells us that the quickest search is often "John Smith" combined with "honorary degree."

#### 8 Think Before You Click

Avoid wasting time on irrelevant sites and pages. Scan the search results blurb for the context in which your terms were used, the URL, the identity of the publisher, and the date (if available).

#### 9 Ask the Expert

*Web Savvy* columnist Brad Grimes says that you can often save time by going to an expert. Got a question about wine? Head to Wine Spectator ([www.winespectator.com](http://www.winespectator.com)), for example, instead of going to Google or Yahoo.

#### 10 Quit It, Already

It's important to know when to stop Web searching, says pundit Danny Sullivan. Depending on your query, sometimes it might be faster to pick up the phone.

# Next-Gen > > >



# DVD

**T**hink DVDs are only for watching the latest Tom Cruise thriller? Think again, because they're on their way to becoming a common business tool that could not only save your skin when your database crashes but also open up brand-new ways of making presentations, training, marketing, and customer communications more effective.

Remember how CDs went from replacing your record collection at home to something you used in the office to install new applications, back up systems, store electronic photographs, and create interactive marketing presentations for prospects and clients? That same process is happening with the DVD: more and more people are beginning to use them for more than simply watching movies.

With a host of capable and experienced vendors working on products and technology, DVD is rapidly encompassing home entertainment, computers, and business information with a single digital format. It is destined to replace audio CD, videotape, laserdisc, CD-ROM, and video game cartridges as well as some tape backups and floppy drives.

With their huge storage capacity (approximately 5 or 10 gigs),

DVDs are increasingly being used to back up and archive large volumes of important business data, applications, videos, and photos. And drawing on their original movie-focused uses, companies are finding that DVD is the perfect way to distribute training materials, create promotional videos, and make existing video collections more acces-

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# Next-Gen DVD

sible and useful.

Over the next couple of years, most organizations can expect to find themselves using DVDs for a variety of business applications, such as the following:

■ **Business** – Many companies need to produce training videos for themselves, their partners, or their customers. Not only do DVDs make it easier to watch such films (since you can easily skip ahead or back to different segments), but they provide new capabilities, like multiple camera angles and different audio tracks, for enhancing the learning experience.

■ **Video Production** – Companies that use video will find that DVD is the perfect storage medium, allowing them to archive new and existing video footage and easily create new content as needed.

■ **Medical** – Medical records, such as radiology data or x-rays, can be massive. DVDs enable health-care organizations or individuals to archive, maintain, or ship electronic medical records easily and cost-effectively.

■ **Government** – DVDs are commonly used to archive data

and records, as well as maintaining presentations and training videos, in government organizations.

■ **Photography** – Digital photography generates huge amounts of data to be stored and archived. In fact, many photographers are shooting a large number of high-resolution photos (or scans of photos) and archiving them on a single DVD before retouching and modifying them.

■ **Advertising/Creative Agencies** – Companies that routinely generate videos, such as a series of trial commercials or different versions of a marketing video, can benefit from DVDs. Not only are they easier to handle than videotapes, but they allow the clients or users to easily skip ahead to the next segment, or replay the existing one, without waiting for the tape to rewind or fast forward.

■ **Education** – DVDs are perfect for archiving any type of class or training session and/or distributing it to a wider audience, since DVD media are relatively inexpensive and very easy to use. A school might videotape class lectures and transfer them to DVD, enabling students to review the lectures at another point or catch up on missed classes.

DVDs and new DVD software can change the way organizations use video for training, distance learning, or client communications. With a product like Pinnacle Systems' Impression DVD Pro, for instance, organizations can easily create training DVDs that go way beyond basic instruction.

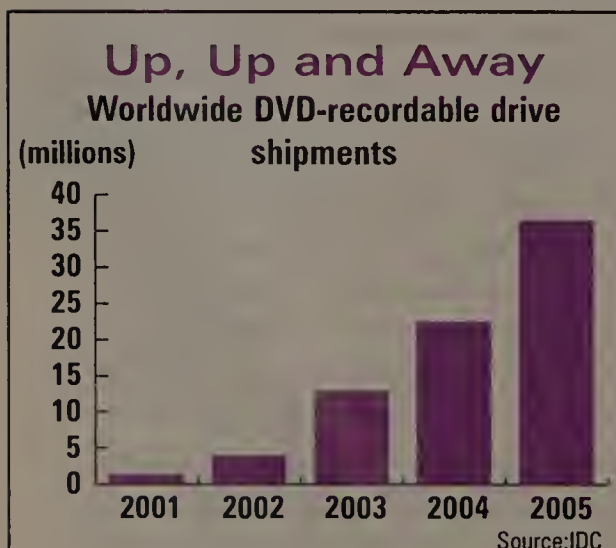


**Pinnacle's Impression DVD Pro: multiple camera angles and audio tracks**

## Impression DVD Pro, from Pinnacle Systems

Impression DVD Pro (and the DVD format) supports multiple camera angles, allowing a company doing a training video on, say, repairing engines to use two cameras to film the training session: one on the presenter as he's speaking, and one on his hands in the engine compartment as he does the repair work. Viewers would then be able to see either or both images as they watched the training DVD. On top of that, you can add multiple audio tracks (say, in English, German, and Spanish), so that the video could support different languages; subtitles can even be added over the images to call out specific items. And DVDs allow you to include navigation capabilities, menus, and questions, so you can even include a quick test at the end of a training segment. If viewers get the right answer, they can go on to the next segment. If not, the DVD automatically takes them back to the appropriate segment of the video, so that they learn the right answer.

Advertising agencies can also use Impression DVD Pro to create sample commercials for clients, putting a whole collection of commercials on a single DVD and let-



# Recordable DVD from the leader in digital media. Perfect for those who need their space.

When it comes to data-intensive storage, two things come to mind: Memorex and DVD. Why Memorex DVD? Over the past two years, more people have trusted and purchased Memorex optical media than any other brand in the world. And with a complete line of DVD formats, each offering 4.7 GB of space, we can help you transfer or store anything off your hard drive—even full-length videos. So if mammoth capacity, quick access rates and bulletproof reliability sound like the solution to your storage problems, we suggest you log onto [www.memorex.com](http://www.memorex.com). Because Memorex DVD is—you guessed it—BIG.



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Is it live or is it Memorex?™

# Next-Gen DVD

ting the client easily review and skip through them. An added benefit of using DVD for this type of scenario is that DVD has a much higher resolution than standard VHS videos, resulting in much cleaner pictures and a better quality of experience for the viewer.

And while DVD players are increasingly ubiquitous, any DVD created with Pinnacle's Impression software can be made to play on standard computer CD players. Impression includes motionCD software, which duplicates the functionality of a DVD player without requiring users to install additional software on their PCs. In addition, DVDs created using motionCD can also include links to Web sites or documents, making it easy to keep content fresh as well as ensuring viewers will access current information.

But DVDs are not only about videos and movies. Their huge storage capacity makes them the prime candidate for the leading position in the next generation of optical backup products. While CDs have become very popular over the past three years as a way to distribute or archive large files and large amounts of data, DVDs offer much more storage in the same form factor.

## Memorex DVD Products

One company that sees the promise of DVD for both archiving and video purposes is Memorex. Memorex's complete line of DVD media, designed for everything from back-up to video production, is a natural extension of its more than 30 years of experience in manufacturing all types of blank media, from videotapes to recordable CDs.

Just as today's blank CDs come in different versions (write-once-only or "R" versus re-writeable or "RW"), DVDs have different formats:

- **DVD-R**— Write-once DVDs, which by definition cannot be re-written. Typically support 4.7GB of storage.
- **DVD-RW**— Re-writeable DVDs that can be used multiple times. Typically support 4.7GB of storage. The DVD-RW format was optimized for recording video (not necessarily data, though it can) and playing it on consumer DVD players.
- **DVD-RAM** — DVDs that specialize in data backup and

## A Place For Everything

Today's huge files demand the huge storage capacity of DVD technology

| Stored File        | Required Storage |
|--------------------|------------------|
| 1 page ASCII text  | 3KB              |
| 1 page FAX         | 50KB             |
| 1 page color image | 5MB              |
| 1 minute CD audio  | 10MB             |
| 1 minute DVD video | 60MB             |

Source: Memorex

archiving. Typically come in a specialized case to prevent external damage to the DVD media. Can support either 4.7GB or 9.4GB of storage, depending on version.

In addition to the DVD-R and DVD-RW formats, selected manufacturers have introduced a newer format, DVD+R and DVD+RW. The new "+" format combines some of the best features of both the DVD-R and the DVD-RAM formats for either video recording or for data backup. Video programs recorded on DVD+R write-once disks will be able to play on the vast majority of DVD drives and players, and the DVD+RW can act as either a video master that can be altered at will or as a super floppy disk backing up hard disk drives.

Memorex produces blank DVDs for all of these standard formats, allowing their customers to select the most appropriate product for the job.

DVDs are one of those unique technologies destined to change the way companies do business. With their huge storage capacity and extensive navigation, video, and audio capabilities, they're useful for everything from capturing training sessions to archiving databases. ■



Memorex's complete line of DVD media, designed for everything from backup to video production.



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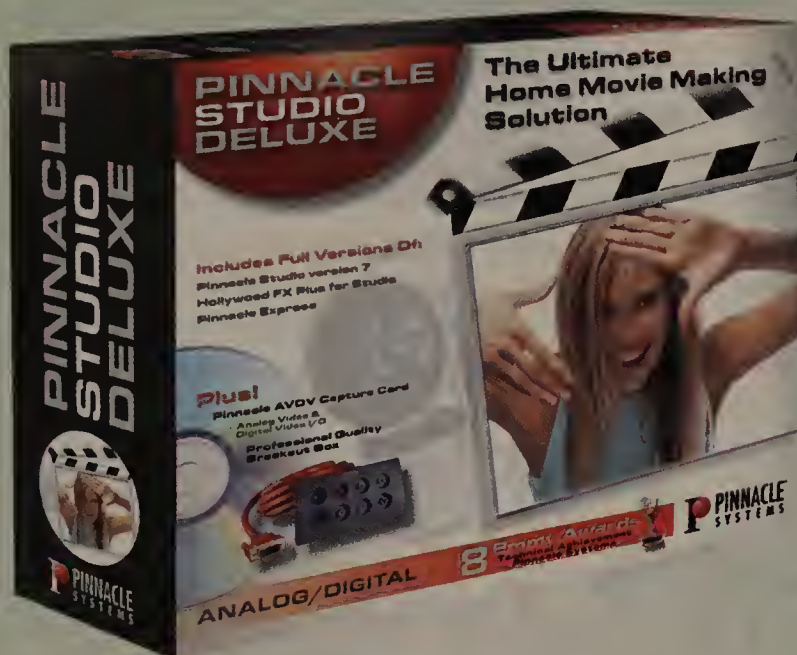


**Pinnacle Express**

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authoring software

**Pinnacle Hollywood FX**

Transitions and  
3D effects package



**Analog & Digital  
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Single card captures footage  
from almost any source

**Professional  
Breakout Box**

Connects all your video  
gear easily

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*Capture footage from both digital and analog sources. Add transitions, effects, titles, music & more. Then burn directly to CD or DVD.*

\*Scott & Eric sold separately.

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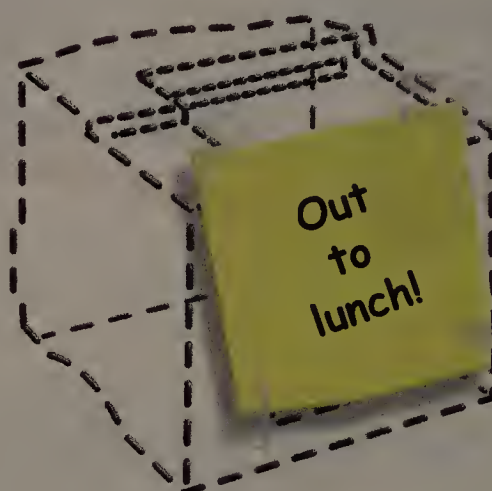
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Nothing,  
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## Where's the Competition?

When faced with the task of marketing the new AW1200, our creative team decided to illustrate the printer's powerful capabilities by comparing it to the competition. This sounded like a great idea, but when our team began working on the first set of ad proposals, we realized there were no other monochrome laser printers capable of tabloid size output at 1200 dpi for under \$1000...go figure : )

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# Smart Sizing

**MATCHING THE  
RIGHT VENDOR  
TO YOUR NEEDS  
IS ABOUT DOLLARS  
AND SENSE.**

**L**ast fall, reporters from a leading magazine went "undercover" to explore the buying channels. What they found consistently was that the Web frequently offers buyers what they most want: freedom of choice, as well as freedom from high-pressure salespeople.

But to use and exploit the Web most effectively, buyers must first educate themselves as to what the myriad of choices before them represents. After all, the computer world can be a jargon-filled, hype-rich environment, often with too many choices.

"The good news today is that careful buyers can match their own knowledge and specific needs to the many different channels out there," notes George Albright, a St. Louis IT business consultant. "If they are careful in doing so, they'll end up with the best price for the level of quality and after-sales support they really need, no more and no less."

Depending upon your needs or those of the organization for which you are buying, there are several factors to consider before selecting the channel through which to buy products and services.

Be honest about your own knowledge. If it is not up to snuff and you can't take the time to educate yourself, you need a channel with trusted personal help and guidance.

Be wary of after-purchase costs. Today the cost of the hardware makes up only 20% of the total ownership cost of a typical PC, according to the Meta Group. The rest is add-ons, support, and training. So the lowest-cost hardware isn't necessarily the lowest-cost alternative in the long run.

Choice is where it's at. Today you have a wide variety of buying-channel options, and this is

truly a buyer's market. Use this information to your advantage to strike the best deals.

Freedom of choice is just what customers around the globe get when shopping for high-end prepress and printing solutions at XANTÉ. Founded in 1989 by Robert C. Ross, Jr., XANTÉ was established to provide a viable printing solution for high-end graphics users. The success of the Accel-a-Writer® upgrade controller for Apple LaserWriter printers, and the subsequent successes of the XANTÉ Accel-a-Writer laser printer

series, have helped XANTÉ become a world leader in laser printing solutions.

Now, just 13 years later, with more than 20 different

products to offer in 65 different countries, XANTÉ is a clear-cut leader in the laser printer industry. Partnerships with Adobe™ Systems for PostScript 3 technology, and Agfa-Gevaert Group to advance prepress solutions through the use of computer-to-plate media technology, are just some of the ways in which XANTÉ has led the way in this cutting-edge industry.

Cutting-edge technology is also found on XANTÉ products. This includes patent-pending innovations such as X•ACT™ (XANTÉ's Accurate Calibration Technology) and NEIT (Negative Enhanced Imaging Technology).

XANTÉ has revolutionized printing with the Platemaker series, which simplifies computer-to-plate printing, and dye sublimation toner, which allows personalized products to be created from the desktop.

As the global laser-printing leader for the 21st century, XANTÉ will continue to make huge technological strides to advance this lightning-fast industry.



**"With more than 20 different products to offer in 65 different countries, XANTÉ is a clear-cut leader in the laser printer industry."**

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# TOP 100

EDITED BY THE REVIEWS STAFF

- 134 OFFICE PCs
- 136 NOTEBOOK PCs
- 138 HOME PCs
- 141 INK JET PRINTERS
- 143 19-INCH MONITORS
- 145 CD-RW DRIVES
- 147 GRAPHICS BOARDS
- 148 DIGITAL CAMERAS
- 149 MORE REVIEWS

143



## Monitors

NEC-Mitsubishi's new professional display, the NEC MultiSync FP955, offers strong text quality and a five-port USB 1.1 hub.



145

## CD-RW Drives

40X CD-RW drives now occupy six of the ten spots on our chart; see how Sony, TDK, and Plextor (clockwise from left) stack up.

## Gateway Gets a Dramatic Makeover

**Highlighting this month's** *Top 15 Office PCs* chart, Gateway presents a sleek, new chassis design. The silver-and-black chassis radically changes the company's longtime standard—putty beige with gray accents. The functional yet aesthetically pleasing design and solid performance of the \$1249 Gateway 500S boost it to the top of our value chart; a variation on this PC earns the Best Buy on our *Top 15 Home PCs* value chart as well.

Elsewhere in the *Top 100*, eight new graphics boards mark a sea change in our *Top 10 Graphics Boards* chart, and five new drives debut on our *Top 10 CD-RW Drives* chart—four of them capable of writing to CD-Rs at 40X.

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### Printers

The Canon S520 Color Bubble Jet Printer prints text quickly; its individual color ink tanks allow you to replace only the colors that are exhausted.

### Graphics Boards

Three new power graphics boards use NVidia's GeForce4 Ti chip set; the GeForce4 MX chip set dominates the value chart.



### Office PCs

The Gateway 500S hides its drives behind a flip-up door; text looks sharp on the unit's matching 15-inch LCD monitor.

## YOUR GUIDE TO THE TOP 100

EACH MONTH WE TEST a large number of PCs, printers, monitors, and other products. Only the best products land on the charts, which are refreshed monthly.

System configurations are shown as tested. The overall rating for each product is calculated on a 100-point scale and reflects results from our hands-on evaluations

and performance tests. A 90-point score is exceptional, while one in the 70s is above average.

The PC WorldBench 4 score is a measure of how fast a PC can run a mix of common business applications as compared with our baseline machine, a Gateway Select 1200 with a 1.2-GHz Athlon processor, 128MB of PC133

SDRAM, and a 20GB hard drive. For example, a PC that scores 120 is 20 percent faster than the baseline system. The policies score is based on vendor support policies (not shown on charts). Please see [find.pcworld.com/15720](http://find.pcworld.com/15720) for additional details on how we compile charts for the *Top 100*.

## TOP 15 OFFICE PCs

|              | POWER SYSTEM                                                 |                             | Overall rating | Street price (4/12/02)   | PC WorldBench 4 performance score <sup>1</sup> | Faster           | Comments                                                                                                                                        |
|--------------|--------------------------------------------------------------|-----------------------------|----------------|--------------------------|------------------------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1            | <b>Best Buy</b> Gateway 700X<br>find.pcworld.com/26921       | NEW                         | 83             | Very expensive<br>\$3098 | Windows XP Professional                        | Good<br>119      | Pricy high-end system packs a powerful punch and includes a crisp 18-inch LCD; the DVD-RAM/R drive is good for data archiving. (★★★★☆)          |
| 2            | Dell Dimension 8200<br>find.pcworld.com/25061                |                             | 82             | Expensive<br>\$2679      | Windows XP Professional                        | Good<br>116      | A solid performer; the chassis features a case lock and tool-free access to drives and slots. (★★★★☆ June 02)                                   |
| 3            | MicronPC Millennia TS Professional<br>find.pcworld.com/21021 |                             | 82             | Average<br>\$1999        | Windows XP Professional                        | Good<br>111      | Offering plenty of expansion room, this PC lets you easily access the case interior and drive bays. Drops \$181 from last month. (★★★★☆ Apr 02) |
| 4            | Micro Express MicroFlex 1900A<br>find.pcworld.com/21022      |                             | 80             | Inexpensive<br>\$1499    | Windows XP Home                                | Very good<br>125 | This reasonably priced model is a top-notch performer and comes with a first-generation DVD+RW recordable drive. (★★★★☆ Apr 02)                 |
| 5            | ABS Conquest G4<br>find.pcworld.com/27041                    | NEW                         | 79             | Average<br>\$1999        | Windows XP Professional                        | Very good<br>125 | Powerful system has four USB 1.1 and four IEEE 1394 ports conveniently placed on the front; small text looked fuzzy on monitor. (★★★★☆)         |
| 6            | Polywell Poly 880NF-2100<br>find.pcworld.com/27021           | NEW                         | 77             | Very expensive<br>\$2888 | Windows XP Professional                        | Very good<br>125 | Fast CPU and memory help this unit achieve high performance scores; the chassis has an exceptional number of drive bays. (★★★★☆)                |
| 7            | Tangent Valera DDR 2000+<br>find.pcworld.com/25281           |                             | 77             | Average<br>\$1999        | Windows XP Professional                        | Good<br>117      | An excellent performer; includes video capture and editing software and four USB 2.0 ports—but no IEEE 1394 ports. (★★★★☆ June 02)              |
| VALUE SYSTEM |                                                              | Percent of overall rating ▶ | 15 percent     | 20 percent               |                                                |                  |                                                                                                                                                 |
| 1            | <b>Best Buy</b> Gateway 500S<br>find.pcworld.com/26961       | NEW                         | 80             | Expensive<br>\$1249      | Windows XP Professional                        | Good<br>108      | PC features a stylish, new silver-and-black chassis that's easy to open; a matching 15-inch LCD monitor displays crisp text. (★★★★☆)            |
| 2            | Micro Express MicroFlex 1800B<br>find.pcworld.com/26981      | NEW                         | 80             | Inexpensive<br>\$999     | Windows XP Professional                        | Very good<br>122 | System achieves its speed in part by using a motherboard with a slightly overclocked CPU as a default setting. (★★★★☆)                          |
| 3            | Dell Dimension 2200<br>find.pcworld.com/27101                | NEW                         | 78             | Expensive<br>\$1329      | Windows XP Professional                        | Average<br>92    | This expensive system has limited expansion room but includes an adequate 15-inch LCD monitor. (★★★★☆)                                          |
| 4            | IBM NetVista A22p<br>find.pcworld.com/19341                  |                             | 78             | Average<br>\$1108        | Windows XP Home                                | Average<br>91    | This model has a pop-off front cover for easy drive-bay access; remote management software can be downloaded. (★★★★☆ Mar 02)                    |
| 5            | Gateway 700L<br>find.pcworld.com/25081                       |                             | 77             | Expensive<br>\$1353      | Windows XP Professional                        | Good<br>106      | This system features a speedy CD-RW drive and delivers good performance for a reasonable price. (★★★★☆ June 02)                                 |
| 6            | HP Vectra XE310<br>find.pcworld.com/25141                    |                             | 77             | Inexpensive<br>\$869     | Windows XP Professional                        | Average<br>90    | A value system for managed corporate environments, this PC features low-end components. (★★★★☆ June 02)                                         |
| 7            | MicronPC ClientPro CR<br>find.pcworld.com/25161              |                             | 75             | Expensive<br>\$1344      | Windows XP Professional                        | Average<br>95    | Though this unit targets business environments, MicronPC doesn't offer any client management software with it. (★★★★☆ June 02)                  |
| 8            | Dell OptiPlex GX240<br>find.pcworld.com/18761                |                             | 75             | Very expensive<br>\$1541 | Windows XP Professional                        | Average<br>91    | This corporate model offers high security and network manageability but little room for expansion. (★★★★☆ Mar 02)                               |
|              |                                                              | Percent of overall rating ▶ | 25 percent     | 15 percent               |                                                |                  |                                                                                                                                                 |

All systems tested or retested under our PC WorldBench 4 test suite. See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings.

<sup>1</sup> Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. See "Your Guide to the Top 100" on page 133 for more details.

<sup>2</sup> Total capacity in gigabytes.

SIX NEW SYSTEMS MAKE OUR OFFICE PCs chart this month, split evenly between the power and value segments. On the power side, Gateway retains the number one spot with its high-end 700X system. This model supplants last month's Best Buy, the 700XL, upping the processor a notch to a 2.4-GHz Pentium 4, doubling the memory to 1GB of RDRAM, and replacing the 15-inch LCD monitor with an 18-inch unit—all without a price hike. Meanwhile, on the value side, Gateway earns a second Best

Buy with the 500S. This Gateway model is the first we've tested for *Top 15 Office PCs* to feature the company's new silver-and-black chassis—a color combination that vendors are increasingly favoring. The 500S includes a 2A-GHz Pentium 4 CPU (which has twice the on-chip Level 2 cache and yet consumes less power than older Pentium 4 chips do); it's the second-best performer on our value chart.

Visit [find.pcworld.com/28101](http://find.pcworld.com/28101) for reviews of all products tested this month and ranked in this chart.

| BASE CONFIGURATION          |                   |                            |                                   |                                                |                           |                    |                                                                                                                                                   | Extra features                | Design/<br>documentation           | Vendor's<br>reliability/<br>service |
|-----------------------------|-------------------|----------------------------|-----------------------------------|------------------------------------------------|---------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------|-------------------------------------|
| CPU                         | RAM<br>(MB/type)  | Hard<br>drive <sup>2</sup> | Monitor size<br>(diagonal inches) | Graphics                                       | Case<br>type <sup>3</sup> | Open<br>bays/slots |                                                                                                                                                   |                               |                                    |                                     |
| 2.4-GHz<br>Pentium 4        | 1024/<br>RDRAM    | 120                        | 18 (LCD)                          | 128MB GeForce4<br>Ti 4600                      | Midsize<br>tower          | 3/3                | <b>Outstanding:</b> DVD-RAM/R drive, <sup>4</sup> 4DX/12X/48X CD-RW drive, V.92<br>modem, network adapter, Microsoft Office XP Small Business Ed. | <b>Good/<br/>Good</b>         | <b>Good/<br/>Fair</b>              |                                     |
| 2.4-GHz<br>Pentium 4        | 256/<br>RDRAM     | 80                         | 17 (LCD)                          | 64MB GeForce3<br>Ti 200                        | Midsize<br>tower          | 3/2                | <b>Good:</b> 24X/10X/40X CD-RW drive, network adapter, case lock,<br>Microsoft Office XP Small Business Edition, Norton Antivirus 2002            | <b>Good/<br/>Good</b>         | <b>Outstanding/<br/>Fair</b>       |                                     |
| 2.2-GHz<br>Pentium 4        | 256/<br>DDR SDRAM | 80                         | 19                                | 64MB VisionTek<br>GeForce3 Ti 200              | Midsize<br>tower          | 4/3                | <b>Very good:</b> 16X DVD-RDM drive, 24X/10X/40X CD-RW drive, V.9D<br>modem, network adapter, Microsoft Office XP Small Business Ed.              | <b>Good/<br/>Good</b>         | <b>Good/<br/>Fair</b> <sup>5</sup> |                                     |
| 1.6-GHz<br>Athlon XP 1900+  | 512/<br>DDR SDRAM | 60                         | 17                                | 64MB GeForce3                                  | Midsize<br>tower          | 4/2                | <b>Very good:</b> DVD+RW drive, <sup>4</sup> V.9D modem, network adapter                                                                          | <b>Good/<br/>Average</b>      | <b><sup>5</sup>/<sup>5</sup></b>   |                                     |
| 1.73-GHz<br>Athlon XP 2100+ | 512/<br>DDR SDRAM | 120                        | 19                                | 128MB PNY<br>GeForce4 Ti<br>4600               | Midsize<br>tower          | 3/1                | <b>Good:</b> 16X DVD-RDM drive, 4DX/12X/48X CD-RW drive, network<br>adapter, Microsoft Office XP Small Business Edition                           | <b>Good/<br/>Good</b>         | <b><sup>5</sup>/<sup>5</sup></b>   |                                     |
| 1.73-GHz<br>Athlon XP 2100+ | 512/<br>DDR SDRAM | 80                         | 18 (LCD)                          | 128MB VisionTek<br>GeForce4 Ti<br>4400         | Midsize<br>tower          | 7/1                | <b>Good:</b> 16X DVD-RDM drive, 24X/10X/40X CD-RW drive, V.90 modem,<br>network adapter, Lotus SmartSuite                                         | <b>Very good/<br/>Good</b>    | <b><sup>5</sup>/<sup>5</sup></b>   |                                     |
| 1.67-GHz<br>Athlon XP 2000+ | 256/<br>DDR SDRAM | 80                         | 19                                | 64MB MSI<br>MS-8850                            | Midsize<br>tower          | 6/4                | <b>Good:</b> 16X DVD-ROM drive, 24X/10X/40X CD-RW drive, network<br>adapter, tool-less drive bay carriers                                         | <b>Very good/<br/>Average</b> | <b><sup>5</sup>/<sup>5</sup></b>   |                                     |
| 10 percent                  |                   |                            |                                   |                                                |                           |                    | 15 percent                                                                                                                                        | 15 percent                    | 25 percent                         |                                     |
| 2A-GHz<br>Pentium 4         | 256/<br>DDR SDRAM | 40                         | 15 (LCD)                          | 32MB GeForce2<br>MX200                         | Midsize<br>tower          | 2/2                | <b>Very good:</b> 16X DVD-RDM drive, 24X/10X/40X CD-RW drive, V.9D<br>modem, network adapter                                                      | <b>Good/<br/>Good</b>         | <b>Good/<br/>Fair</b>              |                                     |
| 1.53-GHz<br>Athlon XP 1800+ | 256/<br>DDR SDRAM | 62                         | 17                                | 64MB Leadtek<br>WinFast<br>GeForce2 Ultra      | Midsize<br>tower          | 3/4                | <b>Good:</b> 16X DVD-RDM drive, 24X/10X/40X CD-RW drive, V.92 modem,<br>network adapter                                                           | <b>Good/<br/>Average</b>      | <b><sup>5</sup>/<sup>5</sup></b>   |                                     |
| 1.3-GHz Celeron             | 256/<br>SDRAM     | 20                         | 15 (LCD)                          | Integrated Intel<br>810E, using main<br>memory | Minitower                 | 1/2                | <b>Very good:</b> 24X/10X/40X CD-RW drive, V.92 modem, network<br>adapter, case lock, Microsoft Office XP Small Business Edition                  | <b>Adequate/<br/>Good</b>     | <b>Outstanding/<br/>Fair</b>       |                                     |
| 1.6-GHz<br>Pentium 4        | 256/<br>SDRAM     | 41                         | 15                                | 32MB VisionTek<br>GeForce2 MX                  | Midsize<br>tower          | 2/3                | <b>Very good:</b> 16X/10X/40X CD-RW drive, network adapter, chassis-<br>intrusion detection, client management software, Wake-on-LAN              | <b>Good/<br/>Average</b>      | <b>Good/<br/>Fair</b>              |                                     |
| 1.8-GHz<br>Pentium 4        | 256/<br>RDRAM     | 40                         | 17                                | 32MB VisionTek<br>GeForce2 MX200               | Midsize<br>tower          | 4/3                | <b>Very good:</b> 16X DVD-RDM drive, 4DX/12X/48X CD-RW drive, net-<br>work adapter, Microsoft Works Suite 2002                                    | <b>Good/<br/>Good</b>         | <b>Good/<br/>Fair</b>              |                                     |
| 1.2-GHz Celeron             | 256/<br>SDRAM     | 20                         | 17                                | Integrated Intel<br>810E, using main<br>memory | Minitower                 | 2/3                | <b>Average:</b> 24X-48X CD-RDM drive, network adapter, tool-less drive<br>bay carriers, client management software, Wake-on-LAN                   | <b>Adequate/<br/>Poor</b>     | <b>Good/<br/>Fair</b>              |                                     |
| 1.7-GHz<br>Pentium 4        | 256/<br>SDRAM     | 40                         | 17                                | 32MB GeForce2<br>MX200                         | Midsize<br>tower          | 5/3                | <b>Good:</b> 16X/10X/40X CD-RW drive, network adapter, Microsoft<br>Office XP Small Business Edition                                              | <b>Good/<br/>Average</b>      | <b>Good/<br/>Fair</b> <sup>5</sup> |                                     |
| 1.8-GHz<br>Pentium 4        | 256/<br>SDRAM     | 20                         | 17                                | 32MB ATI Rage<br>Ultra 32                      | Desktop                   | D/2                | <b>Good:</b> 8X/4X/32X CD-RW drive, network adapter, chassis-intrusion<br>detection, client management software, Wake-on-LAN                      | <b>Good/<br/>Average</b>      | <b>Outstanding/<br/>Fair</b>       |                                     |
| 10 percent                  |                   |                            |                                   |                                                |                           |                    | 15 percent                                                                                                                                        | 10 percent                    | 25 percent                         |                                     |

<sup>1</sup> We define vertical cases as towers (taller than 20 inches), midsize towers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontal cases as desktops (5 inches or taller) or compacts (shorter than 5 inches).

<sup>4</sup> DVD-RW and DVD+RW drives can handle CD-RW functions; DVD-RAM/R drives cannot. DVD-RW drives can also write to DVD-R, but first-generation DVD+RW drives cannot (upcoming next-generation DVD+RW drives will write to DVD+R, a new write-once format).  
<sup>5</sup> Insufficient data to give a rating, or rating is derived from vendor's Reliability and Service survey scores for its home PCs.

Also new on the power chart are ABS's Conquest G4 and Polywell's Poly 880NF-2100, both of which tied the Micro Express MicroFlex 1900A for best performance. Dell's latest value entry, the Dimension 2200, debuts in third place on the strength of its chassis, its software bundle, and Dell's strong record for PC reliability.

The MicroFlex 1800B (second on our value chart) is an oddity: Though it did

very well on our performance tests, Micro Express sent it to us with the CPU slightly overclocked. The company says that this configuration is exactly what customers would receive, with the memory frequency boosted from 133 MHz to 136 MHz and the memory clock speed set to "Turbo." The vendor says it is confident of this system's reliability, but we cannot verify that reliability independently. ►



DELL'S DIMENSION 2200 is an average performer that comes with a 15-inch LCD.

## TOP 15 NOTEBOOK PCs

|                | POWER NOTEBOOK                                                   | Overall rating | Street price (4/18/02)      | PC WorldBench 4 performance score <sup>1</sup> | Faster          | Comments                                                                                                                                                      |
|----------------|------------------------------------------------------------------|----------------|-----------------------------|------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1              | <b>Best Buy</b> IBM ThinkPad A30p<br>find.pcworld.com/18122      | 89             | Expensive \$3099            | Windows 2000                                   | Outstanding 113 | Desktop replacement has dual modular bays, an ergonomic sloping case, and a huge hard drive. PDA syncing bay device is optional. (★★★★☆ Feb 02)               |
| 2              | Dell Inspiron 4100<br>find.pcworld.com/16400                     | 89             | Average \$2149              | Windows 2000                                   | Very good 107   | Portable accommodates lots of add-ins and has dual pointing devices. Optional color palm rests and screen backs cost \$20. (★★★★☆ Jan 02)                     |
| 3              | Gateway Solo 9550xl<br>find.pcworld.com/25381                    | 88             | Average \$2299              | Windows 2000                                   | Very good 111   | Unit comes equipped with a large screen and high-end multimedia connections, including an IEEE 1394 port, but it's big and heavy. (★★★★☆ June 02)             |
| 4              | Dell Latitude C810<br>find.pcworld.com/21182                     | 87             | Average \$2625              | Windows XP Professional                        | Very good 101   | All-in-one has a dual optical drive design but is unavailable with both wireless and standard network connectors built in. (★★★★☆ Apr 02)                     |
| 5              | HP Omnibook 6100<br>find.pcworld.com/16402                       | 87             | Average \$2745              | Windows 2000                                   | Very good 106   | Corporate speedster has a wireless-ready design and a handsome, thin case with a modular bay. Price falls by \$83 this month. (★★★★☆ Jan 02)                  |
| 6              | IBM ThinkPad A31<br>find.pcworld.com/27181                       | NEW 85         | Average \$2674              | Windows XP Professional                        | Average 90      | Dual modular bays are a plus, but lackluster performance puts this desktop replacement low on the chart. (★★★★☆)                                              |
| 7              | Toshiba Satellite 5105-S607<br>find.pcworld.com/27162            | NEW 84         | Average \$2499              | Windows XP Home                                | Good 98         | This heavyweight notebook has plenty of connections (including an IEEE 1394 port) and great sound, but its battery life is limited. (★★★★☆)                   |
| VALUE NOTEBOOK |                                                                  |                | Percent of overall rating ▶ | 15 percent                                     | 20 percent      |                                                                                                                                                               |
| 1              | <b>Best Buy</b> MicronPC TransPort XT2<br>find.pcworld.com/25402 | 83             | Average \$1999              | Windows XP Home                                | Very good 96    | This reasonably lightweight machine is flush with every feature you could want, including a good keyboard and extra audio controls. (★★★★☆ June 02)           |
| 2              | Dell Latitude C610<br>find.pcworld.com/21183                     | 82             | Expensive \$2286            | Windows XP Professional                        | Very good 99    | Revamp of older model allows both wireless and standard networking connections to be built in, eliminating the need for PC Cards. (★★★★☆ Apr 02)              |
| 3              | Gateway Solo 5350ls<br>find.pcworld.com/25403                    | 82             | Average \$1899              | Windows XP Professional                        | Very good 95    | Fairly light two-spindle model has a removable hard drive and a handsome black-and-silver case, but no big extras. (★★★★☆ June 02)                            |
| 4              | HP Omnibook XT6050<br>find.pcworld.com/27261                     | NEW 82         | Average \$2099              | Windows XP Professional                        | Very good 96    | Relatively thin and light notebook has most features corporate users want (including management software), plus a built-in 802.11b network interface. (★★★★☆) |
| 5              | IBM ThinkPad R30<br>find.pcworld.com/16403                       | 82             | Average \$1699              | Windows 2000                                   | Good 88         | Unit has most standard connections, a light at the top of the screen, and built-in 802.11b support. (★★★★☆ Jan 02)                                            |
| 6              | Toshiba Satellite Pro 6000<br>find.pcworld.com/25404             | 81             | Expensive \$2199            | Windows 2000                                   | Very good 99    | Conservative all-black box includes built-in wireless capability; the modular bay accommodates an optical drive or a second battery. (★★★★☆ June 02)          |
| 7              | Compaq Presario 1720<br>find.pcworld.com/19482                   | 81             | Average \$1599              | Windows XP Home                                | Very good 95    | Lightweight, well-equipped consumer laptop comes with a DVD-ROM/CD-RW combination drive and an IEEE 1394 port. (★★★★☆ Mar 02)                                 |
| 8              | Toshiba Satellite 5005-S504<br>find.pcworld.com/19484            | 80             | Average \$1799              | Windows XP Home                                | Very good 95    | Fantastic sound and dedicated audio controls will delight music lovers; also includes SD and SmartMedia slots. (★★★★☆ Mar 02)                                 |
|                |                                                                  |                | Percent of overall rating ▶ | 20 percent                                     | 15 percent      |                                                                                                                                                               |

See find.pcworld.com/10860 for details on PC World's Star Ratings.

<sup>1</sup> Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. See "Your Guide to the Top 100" on page 133 for more details.

<sup>2</sup> Except where noted, all CPUs are SpeedStep chips, which run at a slower speed when on battery power.

<sup>3</sup> In gigabytes.

THE TOP OF OUR NOTEBOOK CHART saw no changes this month, with the IBM ThinkPad A30p and the MicronPC TransPort XT2 retaining the Best Buy positions for power and value notebooks, respectively.

Elsewhere on the chart are two of the first notebooks we've seen based on Intel's Pentium 4 Processor-M—a new version of the Pentium 4 CPU that is designed for notebooks. None of the four notebooks we tested with the new chip climbed high on the chart, however: The best of the lot, IBM's

ThinkPad A31 and Toshiba's Satellite 5105, managed to capture sixth and seventh place among power notebook contenders. Though Intel claims that the Pentium 4-M offers more processing power than the Pentium III-M (which most notebooks use), none of the portables equipped with the new CPU attained PC WorldBench 4 scores higher than 98; that's significantly lower than the marks

Visit [find.pcworld.com/27341](http://find.pcworld.com/27341) for reviews of all products tested this month and ranked in this chart.

| BASE CONFIGURATION     |                 |          |                         |                      |                    | Extra features <sup>4</sup>                                                                                                    | Overall design     | Battery life (hours:min) <sup>5</sup> | Average weight (pounds) <sup>6</sup> | Vendor's reliability/service |
|------------------------|-----------------|----------|-------------------------|----------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|--------------------------------------|------------------------------|
| CPU <sup>2</sup>       | Screen (inches) | RAM (MB) | Hard drive <sup>3</sup> | Pointing device      | Multi-purpose bays |                                                                                                                                |                    |                                       |                                      |                              |
| 1.2-GHz Pentium III-M  | 15              | 256      | 48                      | Eraserhead           | 2                  | <b>Very good:</b> 6X DVD-ROM and 4X/4X/24X CD-RW combination drive, built-in modem and network adapter, Lotus SmartSuite       | <b>Outstanding</b> | <b>Average/</b> 2:19                  | <b>Heavy/</b> 8.5                    | <b>Good/</b> Fair            |
| 1.2-GHz Pentium III-M  | 14.1            | 256      | 20                      | Touchpad, eraserhead | 2                  | <b>Very good:</b> 8X DVD-RDM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Office XP SBE 2DD2 | <b>Very good</b>   | <b>Average/</b> 2:58                  | <b>Heavy/</b> 8.1                    | <b>Good/</b> Fair            |
| 1.2-GHz Pentium III-M  | 15.7            | 512      | 40                      | Touchpad             | 1                  | <b>Very good:</b> 6X DVD-RDM and 4X/4X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Works Suite 2DD2   | <b>Very good</b>   | <b>Good/</b> 3:29                     | <b>Heavy/</b> 9.3                    | <b>Fair/</b> Fair            |
| 1.13-GHz Pentium III-M | 15              | 256      | 30                      | Touchpad, eraserhead | 1                  | <b>Good:</b> 8X DVD-RDM and 8X/8X/24X CD-RW combination drive, built-in modem and network adapter                              | <b>Very good</b>   | <b>Good/</b> 3:00                     | <b>Heavy/</b> 9.1                    | <b>Good/</b> Fair            |
| 1.13-GHz Pentium III-M | 15              | 256      | 30                      | Touchpad, eraserhead | 1                  | <b>Good:</b> 8X DVD-RDM drive, built-in modem and network adapter                                                              | <b>Outstanding</b> | <b>Very good/</b> 3:58                | <b>Average/</b> 7.8                  | <b>Good/</b> Fair            |
| 1.6-GHz Pentium 4-M    | 15              | 256      | 40                      | Eraserhead           | 2                  | <b>Good:</b> 8X DVD-RDM and 4X/4X/24X CD-RW combination drive, built-in network adapter, Lotus SmartSuite                      | <b>Outstanding</b> | <b>Average/</b> 2:33                  | <b>Heavy/</b> 8.2                    | <b>Good/</b> Fair            |
| 1.7-GHz Pentium 4-M    | 15              | 512      | 40                      | Touchpad             | 0                  | <b>Good:</b> 8X DVD-RDM and 8X/8X/24X CD-RW combination drive, built-in modem and network adapter, Lotus SmartSuite            | <b>Outstanding</b> | <b>Poor/</b> 1:31                     | <b>Heavy/</b> 8.9                    | <b>Good/</b> Fair            |
| 5 percent              |                 |          |                         |                      |                    | 10 percent                                                                                                                     | 10 percent         | 5 percent                             | 10 percent                           | 25 percent                   |
| 1-GHz Pentium III-M    | 14.1            | 256      | 20                      | Touchpad             | 1                  | <b>Very good:</b> 8X DVD-RDM and 8X/4X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Office XP SBE 2D02 | <b>Outstanding</b> | <b>Good/</b> 3:05                     | <b>Average/</b> 7.4                  | <b>Fair/</b> <sup>7</sup>    |
| 1-GHz Pentium III-M    | 14.1            | 256      | 20                      | Touchpad, eraserhead | 1                  | <b>Good:</b> 8X DVD-RDM and 8X/8X/24X CD-RW combination drive, built-in modem and network adapter                              | <b>Very good</b>   | <b>Very good/</b> 3:56                | <b>Average/</b> 7.8                  | <b>Good/</b> Fair            |
| 1.13-GHz Pentium III-M | 14              | 256      | 30                      | Touchpad             | 1                  | <b>Good:</b> 8X DVD-ROM and 8X/8X/24X CD-RW combination drive, built-in modem and network adapter, Microsoft Works Suite 2D02  | <b>Very good</b>   | <b>Very good/</b> 4:01                | <b>Average/</b> 7.4                  | <b>Fair/</b> Fair            |
| 1.13-GHz Pentium III-M | 14.1            | 256      | 30                      | Touchpad             | 1                  | <b>Average:</b> 8X DVD-ROM drive, built-in modem and network adapter                                                           | <b>Outstanding</b> | <b>Very good/</b> 4:29                | <b>Light/</b> 6.5                    | <b>Good/</b> Fair            |
| 1-GHz Pentium III      | 14.1            | 256      | 30                      | Eraserhead           | 1                  | <b>Good:</b> 8X/4X/24X CD-RW drive, built-in modem and network adapter, Lotus SmartSuite                                       | <b>Outstanding</b> | <b>Average/</b> 2:22                  | <b>Light/</b> 6.7                    | <b>Good/</b> Fair            |
| 1.2-GHz Pentium III-M  | 15              | 256      | 40                      | Eraserhead           | 1                  | <b>Good:</b> 8X DVD-RDM and 8X/4X/24X CD-RW combination drive, built-in modem and network adapter                              | <b>Very good</b>   | <b>Good/</b> 3:04                     | <b>Average/</b> 7.7                  | <b>Good/</b> Fair            |
| 1-GHz Pentium III-M    | 14.1            | 256      | 20                      | Touchpad             | 1                  | <b>Good:</b> 6X DVD-RDM and 4X/4X/24X CD-RW combination drive, built-in modem and network adapter                              | <b>Average</b>     | <b>Good/</b> 3:13                     | <b>Average/</b> 6.8                  | <b>Fair/</b> Poor            |
| 1.1-GHz Pentium III *  | 15              | 512      | 30                      | Touchpad             | 0                  | <b>Good:</b> 8X DVD-RDM and 8X/4X/24X CD-RW combination drive, built-in modem and network adapter, Lotus SmartSuite            | <b>Very good</b>   | <b>Poor/</b> 1:47                     | <b>Heavy/</b> 8.7                    | <b>Good/</b> Fair            |
| 5 percent              |                 |          |                         |                      |                    | 0 percent                                                                                                                      | 10 percent         | 5 percent                             | 10 percent                           | 25 percent                   |

<sup>4</sup> Word score reflects both listed and unlisted features.

<sup>5</sup> Unless otherwise noted, all notebooks come with a lithium ion battery.

<sup>6</sup> Includes computer, AC adapter, power cord, floppy drive, and optical drive.

<sup>7</sup> Insufficient data to give a rating.

<sup>8</sup> Single-speed desktop CPU.

that otherwise-comparable Pentium III-M-based notebooks often earn.

HP's fourth-place Omnibook XT6050 is the only new entry on the value section of the chart. It offers various features for corporate users (including management client software), and it has built-in 802.11b wireless networking capability.

Several new systems failed to reach the chart, including the \$2499 Gateway 600L

(with a 1.6-GHz Pentium 4-M CPU), the HP Pavilion ZT1190 (a smartly designed \$1635 notebook with plenty of features but disappointing performance), the ultra-portable HP Omnibook 510 (which comes with a media slice that has great speakers, but is rather expensive at \$2899), and the featherlight but limited Sharp PC-UM20. You can read individual reviews of all of these notebooks on our Web site. ►



HP'S OMNIBOOK XT6050 includes a built-in 802.11b wireless network interface.

## TOP 15 HOME PCs

|              | POWER SYSTEM                                                            | Overall rating              | Street price (4/20/02) | PC WorldBench 4 performance score <sup>1</sup> | Faster          | Comments                                                                                                                                   |
|--------------|-------------------------------------------------------------------------|-----------------------------|------------------------|------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 1            | <b>Best BUY</b> MicronPC Millennia XP+ Xtreme<br>find.pcworld.com/25103 | 97                          | Average \$2589         | Windows XP Home                                | Outstanding 123 | One of the fastest systems we've seen; includes latest graphics card and comes with extensive system manual. (★★★★★ June 02)               |
| 2            | Gateway 700XL<br>find.pcworld.com/27662                                 | 97                          | Expensive \$2999       | Windows XP Home                                | Good 118        | Upgraded to a 2.4-GHz CPU, this PC is well stocked for video and image editing. Graphics card features TV-out and DVI-out. (★★★★★)         |
| 3            | HP Pavilion 701<br>find.pcworld.com/27661                               | 89                          | Average \$2473         | Windows XP Home                                | Good 119        | Loaded system includes an excellent LCD monitor that displays brilliant text and rich graphics in our tests. (★★★★★)                       |
| 4            | Dell Dimension 8200<br>find.pcworld.com/19883                           | 88                          | Inexpensive \$2057     | Windows XP Home                                | Adequate 113    | Entertainment PC has powerful sound; monitor is fine for movies, games, but text was fuzzy in our tests. Price drops \$441. (★★★★★ Apr 02) |
| 5            | Alienware Aurora DDR AMD XP 2000<br>find.pcworld.com/23061              | 83                          | Expensive \$3137       | Windows XP Home                                | Outstanding 124 | This PC has blazing speed, a large display, and rich sound. Though it includes loads of storage space, it's pricey. (★★★★★ May 02)         |
| 6            | ABS Digital 4<br>find.pcworld.com/27681                                 | 81                          | Inexpensive \$2069     | Windows XP Home                                | Outstanding 123 | Fastest Pentium-based PC on chart. Speakers delivered crisp sound with booming bass, but monitor was disappointing. (★★★★★)                |
| 7            | Falcon Northwest Mach V 2100+<br>find.pcworld.com/26462                 | 79                          | Expensive \$3434       | Windows XP Home                                | Outstanding 125 | Fastest PC this month is an excellent, albeit expensive, entertainment and gaming system with great audio. (★★★★★ June 02)                 |
| VALUE SYSTEM |                                                                         | Percent of overall rating ▶ | 10 percent             | 25 percent                                     |                 |                                                                                                                                            |
| 1            | <b>Best BUY</b> Gateway 500S <sup>6</sup><br>find.pcworld.com/19884     | 95                          | Average \$1219         | Windows XP Home                                | Good 100        | This Gateway comes nicely packaged with easy-access case and 15-inch LCD monitor. (★★★★★ Apr 02)                                           |
| 2            | Dell Dimension 2200<br>find.pcworld.com/25101                           | 92                          | Very inexpensive \$829 | Windows XP Home                                | Adequate 92     | This entry-level Dell system is sufficiently powerful and comes with reasonably quick CD-RW drive. (★★★★★ June 02)                         |
| 3            | Systemax Ascent EX A17<br>find.pcworld.com/27682                        | 92                          | Expensive \$1529       | Windows XP Home                                | Outstanding 116 | Great for small/home-office work. Generous bundle with personal finance and mapping software. (★★★★★)                                      |
| 4            | Polywell Poly 880NF-1900+<br>find.pcworld.com/27683                     | 89                          | Average \$1375         | Windows XP Home                                | Outstanding 117 | Excellent set of features for the price; but monitor had blurry text, and test games looked washed out. (★★★★★)                            |
| 5            | NuTrend Intrepid SE<br>find.pcworld.com/17301                           | 84                          | Inexpensive \$1099     | Windows XP Home                                | Good 103        | Low-cost but high-performance value PC with nice extra features. Monitor quality is unimpressive, however. (★★★★★ Feb 02)                  |
| 6            | Falcon Northwest Talon 4.3<br>find.pcworld.com/27684                    | 79                          | Average \$1375         | Windows XP Home                                | Outstanding 115 | Fast value system offers few extras. Excellent speakers supplied rich bass and plenty of volume. (★★★★★)                                   |
| 7            | Sony VAIO PCV-RX640<br>find.pcworld.com/25102                           | 79                          | Inexpensive \$1100     | Windows XP Home                                | Adequate 91     | This model includes tons of software for editing images and video. Price is up \$101, but it's still a good deal. (★★★★★ June 02)          |
| 8            | Gateway 300S <sup>8</sup><br>find.pcworld.com/23043                     | 76                          | Very inexpensive \$689 | Windows XP Home                                | Adequate 87     | Two USB 1.1 ports and fair Celeron performance at bargain price, but 15-inch CRT monitor's images are poor. (★★★★★ May 02)                 |
|              |                                                                         | Percent of overall rating ▶ | 20 percent             | 30 percent                                     |                 |                                                                                                                                            |

Go to [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings.

<sup>1</sup> Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. For more details, see "Your Guide to the Top 100" on page 133.

<sup>2</sup> Total capacity in gigabytes.

<sup>3</sup> Vertical cases are towers (over 20 inches), midsize towers (15.5 to 20 inches), or minitowers (under 15.5 inches). Horizontal cases are desktops (5 inches or taller) or compacts (under 5 inches). All-in-one PCs integrate a system and a monitor.

TOP-NOTCH SPEED SCORES help the MicronPC Millennia XP+ Xtreme retain first place, but it has tough competition from a powerful new Gateway system. An upgrade of last month's number three power home PC, the second-place Gateway 700XL now comes with a 2.4-GHz Pentium 4, (versus last month's 2.2-GHz P4) and a spacious 18-inch LCD monitor (up from 15 inches) for the same price. But the new 700XL also produced the same PC WorldBench 4 score as last month's model. It is outfitted

with all the tools you'll need to put your digital videos onto DVD: IEEE 1394 ports, MGI's VideoWave editing software, an enormous hard drive, and a DVD-RAM/R drive. At \$2999, it's also one of the priciest machines on the chart.

Like the Gateway, the number three HP Pavilion 701 is fast and loaded. It costs \$526 less, but comes with a slightly smaller display and only a DVD-ROM drive.

Visit [find.pcworld.com/28081](http://find.pcworld.com/28081) for reviews of all products tested this month and ranked in this chart.

|  | BASE CONFIGURATION             |                    |                            |                     |                                        |                           | Extra features                                                                                                                                             | Graphics/<br>sound<br>quality     | Setup and<br>ease of use | Vendor's<br>reliability/<br>service |
|--|--------------------------------|--------------------|----------------------------|---------------------|----------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------|-------------------------------------|
|  | CPU                            | RAM<br>(MB/type)   | Hard<br>drive <sup>2</sup> | Monitor<br>(inches) | Graphics                               | Case<br>type <sup>3</sup> |                                                                                                                                                            |                                   |                          |                                     |
|  | 1.67-GHz<br>Athlon XP<br>2000+ | 512/<br>DDR SDRAM  | 120                        | 19                  | 128MB GeForce4 Ti<br>4600 AGP          | Midsize<br>tower          | <b>Good:</b> DVD-RW drive, <sup>4</sup> V.90 modem, network adapter, Pinnacle Studio 7                                                                     | <b>Very good/<br/>Very good</b>   | <b>Outstanding</b>       | <b>Fair/<br/>Fair</b>               |
|  | 2.4-GHz<br>Pentium 4           | 1024/<br>DDR SDRAM | 120                        | 18 (LCD)            | 128MB GeForce4 Ti<br>4600              | Midsize<br>tower          | <b>Outstanding:</b> DVD-RAM/OVD-R drive, <sup>4</sup> 24X/10X/40X CD-RW drive, V.92<br>modem, network adapter, Microsoft Office XP Small Business Edition  | <b>Very good/<br/>Very good</b>   | <b>Very good</b>         | <b>Fair/<br/>Fair</b>               |
|  | 1.67-GHz<br>Athlon XP<br>2000+ | 1024/<br>DDR SDRAM | 120                        | 17 (LCD)            | 32MB NForce 4200                       | Midsize<br>tower          | <b>Outstanding:</b> 16X DVD-ROM drive, 24X/10X/40X CD-RW drive, V.90 modem,<br>network adapter, Microsoft Works 6, Corel WordPerfect Office 2002           | <b>Very good/<br/>Good</b>        | <b>Good</b>              | <b>Fair/<br/>Poor</b>               |
|  | 2.2-GHz<br>Pentium 4           | 256/<br>DDR SDRAM  | 80                         | 19                  | 64MB GeForce3<br>Ti 500                | Midsize<br>tower          | <b>Good:</b> 16X DVD-ROM drive, 24X/10X/40X CD-RW drive, V.90 modem, network<br>adapter, Microsoft Works Suite 2002                                        | <b>Very good/<br/>Outstanding</b> | <b>Very good</b>         | <b>Outstanding/<br/>Good</b>        |
|  | 1.67-GHz<br>Athlon XP<br>2000+ | 512/<br>DDR SDRAM  | 100                        | 19                  | 64MB GeForce3<br>Ti 500                | Tower                     | <b>Good:</b> 16X DVD-ROM drive, 24X/10X/40X CD-RW drive, V.90 modem, network<br>adapter, Plantronics LS-1 headphones, game pad, joystick, Works Suite 2002 | <b>Very good/<br/>Outstanding</b> | <b>Very good</b>         | <b>5/5</b>                          |
|  | 2.4-GHz<br>Pentium 4           | 512/<br>DDR SDRAM  | 120                        | 19                  | 128MB GeForce4<br>Ti 4600              | Midsize<br>tower          | <b>Good:</b> 16X DVD-ROM drive, 40X/12X/40X CD-RW drive, V.90 modem, network<br>adapter, WordPerfect Office 2002                                           | <b>Good/<br/>Good</b>             | <b>Very good</b>         | <b>5/5</b>                          |
|  | 1.73-GHz<br>Athlon XP<br>2100+ | 512/<br>DDR SDRAM  | 80                         | 19                  | 128MB GeForce4<br>Ti 4600              | Midsize<br>tower          | <b>Average:</b> 16X DVD-ROM drive, 40X/12X/40X CD-RW drive, network adapter,<br>Deus Ex, Giants games                                                      | <b>Very good/<br/>Very good</b>   | <b>Very good</b>         | <b>5/5</b>                          |
|  | 10 percent                     |                    |                            |                     |                                        |                           | 10 percent                                                                                                                                                 | 15 percent                        | 5 percent                | 25 percent                          |
|  | 1.8-GHz<br>Pentium 4           | 256/<br>DDR SDRAM  | 40                         | 15 (LCD)            | 64MB GeForce2<br>MX400                 | Minitower                 | <b>Very good:</b> 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, V.92 modem,<br>network adapter, Microsoft Works Suite 2002                                   | <b>Very good/<br/>Average</b>     | <b>Very good</b>         | <b>Fair/<br/>Fair</b>               |
|  | 1.3-GHz<br>Celeron             | 256/<br>SDRAM      | 20                         | 17                  | Integrated<br>Intel 810 <sup>7</sup>   | Minitower                 | <b>Good:</b> 24X/10X/40X CD-RW drive, V.92 modem, network adapter, Microsoft<br>Works Suite 2001                                                           | <b>Poor/<br/>Average</b>          | <b>Good</b>              | <b>Outstanding/<br/>Good</b>        |
|  | 1.73-GHz<br>Athlon XP<br>2100+ | 512/<br>DDR SDRAM  | 80                         | 15 (LCD)            | 64MB GeForce3<br>Ti 200                | Midsize<br>tower          | <b>Outstanding:</b> 16X DVD-ROM drive, 24X/10X/40X CD-RW drive, V.90 modem,<br>network adapter, Works Suite 2002, Ahead Nero CD mastering software         | <b>Good/<br/>Good</b>             | <b>Very good</b>         | <b>5/5</b>                          |
|  | 1.67-GHz<br>Athlon XP<br>1900+ | 256/<br>DDR SDRAM  | 100                        | 19                  | 32MB GeForce2 MX                       | Midsize<br>tower          | <b>Very good:</b> 16X DVD-ROM drive, 24X/10X/40X CD-RW drive, V.90 modem, net-<br>work adapter                                                             | <b>Good/<br/>Average</b>          | <b>Good</b>              | <b>5/5</b>                          |
|  | 1.7-GHz<br>Pentium 4           | 256/<br>DDR SDRAM  | 40                         | 17                  | 32MB VisionTek<br>GeForce2 MX200       | Midsize<br>tower          | <b>Very good:</b> 16X DVD-ROM drive, 24X/10X/40X CD-RW drive, V.92 modem, net-<br>work adapter, WordPerfect Office 2002                                    | <b>Good/<br/>Very good</b>        | <b>Good</b>              | <b>5/5</b>                          |
|  | 1.53-GHz<br>Athlon XP<br>1800+ | 256/<br>DDR SDRAM  | 40                         | 17                  | 64MB GeForce4<br>MX440                 | Midsize<br>tower          | <b>Average:</b> 16X DVD-ROM drive, V.90 modem, network adapter                                                                                             | <b>Very good/<br/>Good</b>        | <b>Average</b>           | <b>5/5</b>                          |
|  | 1.3-GHz<br>Celeron             | 256/<br>SDRAM      | 60                         | 17                  | Integrated Intel<br>815E <sup>7</sup>  | Minitower                 | <b>Good:</b> 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, V.90 modem, network<br>adapter, multimedia software                                               | <b>Poor/<br/>Average</b>          | <b>Good</b>              | <b>Good/ <sup>5</sup></b>           |
|  | 1.3-GHz<br>Celeron             | 128/<br>SDRAM      | 20                         | 15                  | Integrated Intel<br>815EP <sup>7</sup> | Minitower                 | <b>Good:</b> 16X/10X/40X CD-RW drive, V.92 modem, network adapter, Works<br>Suite 2002                                                                     | <b>Poor/<br/>Average</b>          | <b>Very good</b>         | <b>Fair/<br/>Fair</b>               |
|  | 10 percent                     |                    |                            |                     |                                        |                           | 10 percent                                                                                                                                                 | 10 percent                        | 5 percent                | 25 percent                          |

<sup>4</sup> DVD-RW and DVD+RW drives can handle CD-RW functions; DVD-RAM/R drives cannot. DVD-RW drives can also write DVD-R, but DVD+RW drives cannot (upcoming next-generation DVD+RW drives will write to DVD+R, a new write-once format).

<sup>5</sup> Insufficient data to give a rating.

<sup>6</sup> Same configuration as last month's Gateway 500XL.

<sup>7</sup> Uses main memory.

<sup>8</sup> Same configuration as last month's Gateway 300C.

The third new system on our power chart, ABS's Digital 4 is relatively cheap for its class (only the less-robust Dell Dimension 8200 has a lower price) and offers impressive speed but a modest set of features.

Systemax has focused on business PCs in the past, but the company is broadening into the home PC market, starting with the new Ascent EX A17, third on our value list. Its beefy configuration includes

an LCD monitor and a robust software bundle, yet it's reasonably priced. Two more noteworthy new systems, Polywell's Poly 880NF-1900+ and Falcon Northwest's Talon 4.3, land in fourth and sixth place, respectively. Both are equipped with fast AMD Athlon XP processors and turned in excellent PC WorldBench 4 performance scores. The Polywell is now the fastest PC on the value chart. ►



HP'S PAVILION 701 features an IEEE 1394 port in front and a flip-open CD-ROM case.

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# TOP 10 PRINTERS

TOP 100

TEST  
Center

Visit [find.pcworld.com/27481](http://find.pcworld.com/27481) for reviews of all products tested this month and ranked in this chart.

CANON'S S520 Color Bubble Jet Printer, one of two new Canon models, hits number four with good text speed and smooth images. The \$299 Canon S820 photo printer creates lovely color photos, but its slowness makes it a poor choice for everyday jobs and its high price keeps it off the chart.

We also reviewed two printers from Lexmark. The ninth-place Z65 Color Jetprinter has a high-capacity output tray and two input trays. Lexmark's \$89 Z45 Color Jetprinter misses the chart despite churning out 8.3 text pages per minute. The reason: The Z45's test images looked dotted and dark. ►

|    | INK JET PRINTER                                                                                                           | Street price (4/19/02) | Overall rating | Speed for plain text/full-page graphics (ppm) | Print quality for text/graphics | Cost per page for monochrome/color (cents) | Comments                                                                                                                                                                                                                                                                                                                  |
|----|---------------------------------------------------------------------------------------------------------------------------|------------------------|----------------|-----------------------------------------------|---------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | <b>Best BUY</b> Epson Stylus C80<br><a href="http://find.pcworld.com/16660">find.pcworld.com/16660</a>                    | \$149                  | 91             | 6.9/1.5                                       | Adequate/Good                   | 3.8/12.5                                   | <b>FEATURES:</b> Rated 12 ppm monochrome/5 ppm color. 2880-by-720-dpi maximum resolution, 150 sheets input, 30 output. <b>SUMMARY:</b> Fast unit is good for high-volume home-office printing. Excels at photos and uses pigment-based inks, so photos should last longer. Price drops by \$30 this month. (★★★★☆ Jan 02) |
| 2  | <b>Best BUY</b> Canon S750 Color Bubble Jet Printer<br><a href="http://find.pcworld.com/22841">find.pcworld.com/22841</a> | \$199                  | 90             | 7.2/1.2                                       | Very good/Good                  | 2/8.8                                      | <b>FEATURES:</b> Rated 20 ppm monochrome/13 ppm color. 2400-by-1200-dpi maximum resolution, 100 sheets input, 50 output. <b>SUMMARY:</b> The quick S750 printed beautiful glossy photos, and handled text with accuracy and speed. Its gray-scale images and lines were only adequate. (★★★★☆ May 02)                     |
| 3  | Lexmark Z43 Color Jetprinter<br><a href="http://find.pcworld.com/10561">find.pcworld.com/10561</a>                        | \$100                  | 85             | 4.6/0.6                                       | Good/Good                       | 5.1/18.9                                   | <b>FEATURES:</b> Rated 12 ppm monochrome/6 ppm color. 2400-by-1200-dpi maximum resolution, 100 sheets input, 50 output. <b>SUMMARY:</b> Delivered clean text; crisp, narrow parallel lines; and detailed, realistic color graphics. Photos were washed out and somewhat fuzzy, though. (★★★★☆ Jan 02)                     |
| 4  | Canon S520 Color Bubble Jet Printer <b>NEW</b><br><a href="http://find.pcworld.com/27442">find.pcworld.com/27442</a>      | \$149                  | 85             | 6.6/1                                         | Good/Very good                  | 2/10.7                                     | <b>FEATURES:</b> Rated 14 ppm monochrome/10 ppm color. 2400-by-1200-dpi maximum resolution, 100 sheets input, 50 output. <b>SUMMARY:</b> Text printed fast but looked somewhat fuzzy. Graphics and photos were smooth and detailed. Colors looked slightly oversaturated. (★★★★☆)                                         |
| 5  | HP Deskjet 940c Color Inkjet Printer<br><a href="http://find.pcworld.com/16681">find.pcworld.com/16681</a>                | \$149                  | 83             | 4.7/0.7                                       | Good/Good                       | 6/13.8                                     | <b>FEATURES:</b> Rated 12 ppm monochrome/10 ppm color. 2400-by-1200-dpi maximum resolution, 150 sheets input, 50 output. <b>SUMMARY:</b> Gray-scale images looked wonderful in our tests; glossy photos displayed great detail and texture but were too dark. (★★★★☆ Jan 02)                                              |
| 6  | HP Deskjet 845c Color Inkjet Printer<br><a href="http://find.pcworld.com/16680">find.pcworld.com/16680</a>                | \$79                   | 82             | 3.8/0.5                                       | Adequate/Good                   | 6/13.7                                     | <b>FEATURES:</b> Rated 8 ppm monochrome/5 ppm color. 1200-by-600-dpi maximum resolution, 100 sheets input, 50 output. <b>SUMMARY:</b> Delivered smooth, detailed gray-scale images and superb highlights and shadows on photos. Price drop of \$20 pushes it up one spot. (★★★★☆ Jan 02)                                  |
| 7  | Lexmark Z53 Color Jetprinter<br><a href="http://find.pcworld.com/10560">find.pcworld.com/10560</a>                        | \$130                  | 81             | 5.9/0.6                                       | Good/Very good                  | 5.1/18.9                                   | <b>FEATURES:</b> Rated 16 ppm monochrome/8 ppm color. 2400-by-1200-dpi maximum resolution, 100 sheets input, 50 output. <b>SUMMARY:</b> Printed text considerably faster than the Z43, but is otherwise very similar. Colors appeared too bright in photo tests. (★★★★☆ Jan 02)                                           |
| 8  | HP Deskjet 920c Color Inkjet Printer<br><a href="http://find.pcworld.com/19264">find.pcworld.com/19264</a>                | \$99                   | 80             | 4.2/0.7                                       | Good/Very good                  | 6/13.8                                     | <b>FEATURES:</b> Rated 5.2 ppm monochrome/2.2 ppm color. 2400-by-1200-dpi maximum resolution, 100 sheets input, 50 output. <b>SUMMARY:</b> Affordable printer with respectable print quality. Both gray-scale and color graphics were attractive. Limited 90-day warranty is unimpressive. (★★★★☆ Mar 02)                 |
| 9  | Lexmark Z65 Color Jetprinter <b>NEW</b><br><a href="http://find.pcworld.com/27441">find.pcworld.com/27441</a>             | \$199                  | 76             | 6.6/1.2                                       | Good/Good                       | 5/12.8                                     | <b>FEATURES:</b> Rated 21 ppm monochrome/15 ppm color. 4800-by-1200-dpi maximum resolution, 250 sheets input, 150 output. <b>SUMMARY:</b> The Z65 is fairly fast and has two input trays for switching media quickly. Though print quality was acceptable, images looked somewhat fuzzy and dotted. (★★★★☆)               |
| 10 | Epson Stylus C60<br><a href="http://find.pcworld.com/16647">find.pcworld.com/16647</a>                                    | \$79                   | 75             | 5.6/1.4                                       | Adequate/Adequate               | 5/15                                       | <b>FEATURES:</b> Rated 12 ppm monochrome/8 ppm color. 2880-by-720-dpi maximum resolution, 100 sheets input, 30 output. <b>SUMMARY:</b> This capable photo printer produced subtle details with impressive speed, though some shots showed a slightly red cast. Price drops \$20 this month. (★★★★☆ Jan 02)                |

**HOW WE TEST:** The overall rating for color ink jet printers is based on price (25 percent), print quality (20 percent), features (15 percent), ease of use (15 percent), speed (10 percent), service and support (10 percent), and cost of consumables (5 percent). Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings.

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\*Cross-platform compatible with WIN XP, ME, 2000, 98SE, Mac OS 9-10x and Linux 2.4.17, Win98SE requires the one time installation of the WIN98SE driver, which ships with the product and is available for download at <http://www.usbdrive.com/support.htm>.

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# TOP 10 MONITORS

TOP 100

TEST  
Center

Visit [find.pcworld.com/27825](http://find.pcworld.com/27825) for reviews of all products tested this month and ranked in this chart.

THREE NEW 19-INCH MODELS land on the chart this month. The CTX PR960FL shows sharp text and bright colors, but it lacks extras, unlike the other newcomers. Compaq's MV9500 delivers above-average image quality, and it includes detachable speakers. NEC-Mitsubishi's professional display,

the NEC MultiSync FP955, has a five-port USB 1.1 hub. You can get it with an optional hardware color-calibrator, but that package costs a total of \$1019. Meanwhile, lackluster image quality from a new Samsung model kept it from making the list. Next month we'll look at 21-inch CRT displays. ►

|    | 19-INCH MONITOR                                                                                       | Street price (4/19/02) | Overall rating | Quality of text/graphics | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----|-------------------------------------------------------------------------------------------------------|------------------------|----------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | <b>Best BUY</b> ViewSonic GS790<br><a href="http://find.pcworld.com/10573">find.pcworld.com/10573</a> | \$285                  | 96             | Very good/<br>Very good  | <b>FEATURES:</b> 18-inch viewable area, .26mm <sup>1</sup> shadow mask tube, up to 95-Hz refresh rate, <sup>2</sup> up to 1600 by 1200 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. <b>SUMMARY:</b> Vibrant and realistic colors make this model a good choice for graphics pros, and sharp text makes it well suited for word processing, too. Short case depth would suit cramped spaces. (★★★★☆ Sept 01)                                  |
| 2  | <b>Best BUY</b> Optiquest Q95<br><a href="http://find.pcworld.com/10800">find.pcworld.com/10800</a>   | \$215                  | 94             | Very good/<br>Very good  | <b>FEATURES:</b> 18-inch viewable area, .27mm <sup>1</sup> shadow mask tube, up to 80-Hz refresh rate, <sup>2</sup> up to 1600 by 1200 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. <b>SUMMARY:</b> The cheapest monitor on the chart, this is a fine choice for price-conscious buyers who don't need extras such as USB ports or built-in speakers. Text looked sharp and colors appeared bright. (★★★★☆ Sept 01)                          |
| 3  | Sony CPD-G420S<br><a href="http://find.pcworld.com/10577">find.pcworld.com/10577</a>                  | \$430                  | 91             | Very good/<br>Very good  | <b>FEATURES:</b> 17.9-inch viewable area, .24mm-.25mm <sup>1</sup> FD Trinitron aperture grille tube, <sup>3</sup> up to 85-Hz refresh rate, <sup>2</sup> up to 1800 by 1400 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. <b>SUMMARY:</b> Well suited for heavy word processing or professional graphics work, but other monitors on our chart cost much less and provide comparable image quality. (★★★★☆ Sept 01)                          |
| 4  | CTX PR960FL<br><a href="http://find.pcworld.com/27822">find.pcworld.com/27822</a> <b>NEW</b>          | \$349                  | 91             | Very good/<br>Very good  | <b>FEATURES:</b> 18-inch viewable area, .24mm-.25mm <sup>1</sup> FD Trinitron aperture grille tube, <sup>3</sup> up to 102-Hz refresh rate, <sup>2</sup> up to 1920 by 1440 resolution at 70 Hz, three-year warranty, 12-hour weekday toll-free support. <b>SUMMARY:</b> Offers crisp text and vibrant colors for a reasonable price. Complies with the widely used MPRII specification but (unlike other monitors here) not with the more stringent TCO standard. (★★★★☆) |
| 5  | Hewlett-Packard P920<br><a href="http://find.pcworld.com/10578">find.pcworld.com/10578</a>            | \$415                  | 91             | Very good/<br>Very good  | <b>FEATURES:</b> 17.9-inch viewable area, .24mm <sup>1</sup> Diamondtron NF aperture grille tube, up to 99-Hz refresh rate, <sup>2</sup> up to 1920 by 1440 resolution at 70 Hz, three-year warranty, 11-hour weekday toll-free support. <b>SUMMARY:</b> Delivers pleasing color and fine, clear text. Like the number four CTX PR960FL and the number eight NEC MultiSync FP955, this model supports a high maximum resolution. (★★★★☆ Sept 01)                           |
| 6  | Compaq MV9500<br><a href="http://find.pcworld.com/27823">find.pcworld.com/27823</a> <b>NEW</b>        | \$399                  | 90             | Very good/<br>Very good  | <b>FEATURES:</b> 18.1-inch viewable area, .26mm <sup>1</sup> shadow mask tube, up to 85-Hz refresh rate, <sup>2</sup> up to 1600 by 1200 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. <b>SUMMARY:</b> Sharp text and pretty colors make this newcomer ideal for heavy text or graphics use. Comes with detachable external speakers. Sheds beige in favor of a black bezel with silver accents. (★★★★☆)                                      |
| 7  | NEC MultiSync FE950+<br><a href="http://find.pcworld.com/23302">find.pcworld.com/23302</a>            | \$349                  | 90             | Very good/<br>Very good  | <b>FEATURES:</b> 17.9-inch viewable area, .25mm-.27mm <sup>1</sup> Diamondtron NF aperture grille tube, <sup>3</sup> up to 89-Hz refresh rate, <sup>2</sup> up to 1600 by 1200 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. <b>SUMMARY:</b> Provides above-average image quality for both text and graphics, but the seven-button control interface could confuse some users. (★★★★☆ May 02)                                                 |
| 8  | NEC MultiSync FP955<br><a href="http://find.pcworld.com/27824">find.pcworld.com/27824</a> <b>NEW</b>  | \$419                  | 90             | Very good/<br>Good       | <b>FEATURES:</b> 17.9-inch viewable area, .24mm <sup>1</sup> Diamondtron NF aperture grille tube, up to 101-Hz refresh rate, <sup>2</sup> up to 1920 by 1440 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. <b>SUMMARY:</b> High-end display delivers stronger text than graphics. For \$1019 you can purchase it with an optional hardware color-calibrator to tweak color accuracy. Five-port USB 1.1 hub comes standard. (★★★★☆)            |
| 9  | IBM P97<br><a href="http://find.pcworld.com/18803">find.pcworld.com/18803</a>                         | \$499                  | 89             | Very good/<br>Very good  | <b>FEATURES:</b> 18-inch viewable area, .24mm-.25mm <sup>1</sup> FD Trinitron aperture grille tube, <sup>3</sup> up to 85-Hz refresh rate, <sup>2</sup> up to 1600 by 1200 resolution at 70 Hz, TCO '95 compliant, three-year warranty, 24-hour daily toll-free support. <b>SUMMARY:</b> Pricy display renders sharp lettering and delicately detailed photos—it's a solid choice for heavy text work or video editing. Black case is handsome. (★★★★☆ Feb 02)             |
| 10 | Dell P992<br><a href="http://find.pcworld.com/23341">find.pcworld.com/23341</a>                       | \$429                  | 89             | Very good/<br>Very good  | <b>FEATURES:</b> 17.9-inch viewable area, .24mm-.25mm <sup>1</sup> FD Trinitron aperture grille tube, <sup>3</sup> up to 90-Hz refresh rate, <sup>2</sup> up to 1920 by 1440 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. <b>SUMMARY:</b> Provides solid text and graphics, and has plenty of easy-to-use controls (including both vertical and horizontal moiré controls) in the on-screen menu. (★★★★☆ May 02)                             |

**HOW WE TEST:** Twelve judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays screens of typical letters, spreadsheets, Web pages, and scanned photos. Overall rating is based on text and graphics quality (25 percent each), price (25 percent), features and ease of use (20 percent), and service and support (5 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings. All monitors are TCO '99-compliant unless otherwise indicated. <sup>1</sup> Represents diagonal dot pitch for shadow mask and stripe or varying stripe pitch for aperture grille monitors. <sup>2</sup> Maximum refresh rate at 1280 by 1024 resolution (as tested on this size monitor). <sup>3</sup> Uses aperture grille in which parallel wires near the sides of the screen are strung farther apart than those at the middle.

# What every CEO needs to know.

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**TASKS:** What you have to do.

**HOT ITEMS:** Know what's selling the most right now.

**REMINDERS:** Things you gotta get to, problems you gotta solve.

The screenshot shows the Oracle Small Business Suite interface with the following sections:

- Search:** Search for items by Name or Search For.
- Settings:** Set Preferences, Customize Center, Set up Synchronization, Change E-mail/Password.
- Top 5 Sales Reps:**

| Name             | Amount      |
|------------------|-------------|
| 1. Mark Grogan   | \$62,119.25 |
| 2. Clark Koozer  | \$8,152.30  |
| 3. Krista Barton | \$1,097.75  |
| 4. Sam R Cruz    | \$887.85    |
- Events:**
  - 10:00 am Press Interview
  - 12:00 pm Lunch with Brian
  - 3:00 pm Staff meeting
  - More...
- Tasks (show order):**

| Due Date  | Task Title                      | Priority | Company                    |
|-----------|---------------------------------|----------|----------------------------|
| 3/28/2002 | Discuss Hardware Supply Problem | High     | Amateur Computers          |
| 3/28/2002 | Re-negotiate Insurance Rates    | Medium   | Carbray Insurance Agency   |
| 3/28/2002 | Schedule Employee Reviews       | Low      |                            |
| 3/28/2002 | Call Lawyers Re:Telco Contact   | High     | Steele & Frock Law Offices |
| 3/28/2002 | Schedule Meeting with Broker    | Medium   | Stein Investments          |
| 3/28/2002 | Pick up Airline Tickets         | Low      |                            |
- Shortcuts:**
  - Tasks
  - Calendar
  - Create Invoices
  - Accept Payments
  - Write Checks
  - Income Statement
- Corporate Accounts:**

| Name                   | primary Contact | Phone        | E-mail            | Fax          |
|------------------------|-----------------|--------------|-------------------|--------------|
| Bay Media research     | Wally Morion    | 800-555-0609 |                   |              |
| Chesa Art Gallery      | Baron Cheas     | 831-555-5229 | cheaa@chessa.com  | 831-555-5230 |
| CVM Business Solutions | Milosz Adamczyk | 650-555-7709 | admin@cvmbiz.com  | 650-555-7710 |
| Jennings Financial     | Anita Jennings  | 916-555-0805 |                   | 916-555-0806 |
| Linda's Dance Studio   | Linda Jones     | 650-555-4205 | lina19873@aol.com |              |
- Top 5 Customers:**

| Name                       | Amount      |
|----------------------------|-------------|
| 1. CVM Business Solutions  | \$21,561.95 |
| 2. Jennings Financial      | \$16,783.75 |
| 3. Chesa Art Gallery       | \$10,404.22 |
| 4. Williams Wireless World | \$8,314.75  |
| 5. Mark's Sporting Goods   | \$6,999.45  |
- Top 5 Sales By Item:**

| Item | Amount |
|------|--------|
| 201  | 18     |
| 15   | 16     |
| 16   | 14     |
| 17   | 12     |
| 18   | 10     |
| 19   | 8      |
| 20   | 6      |
| 21   | 4      |
| 22   | 2      |
| 23   | 1      |
| 24   | 0      |
| 25   | 0      |
| 26   | 0      |
| 27   | 0      |
| 28   | 0      |
| 29   | 0      |
| 30   | 0      |
| 31   | 0      |
| 32   | 0      |
| 33   | 0      |
| 34   | 0      |
| 35   | 0      |
| 36   | 0      |
| 37   | 0      |
| 38   | 0      |
| 39   | 0      |
| 40   | 0      |
| 41   | 0      |
| 42   | 0      |
| 43   | 0      |
| 44   | 0      |
| 45   | 0      |
| 46   | 0      |
| 47   | 0      |
| 48   | 0      |
| 49   | 0      |
| 50   | 0      |
- Reminders:**
  - 15 Employees to Pay
  - 2 Purchase Orders to Receive
  - 7 Bills to Pay
  - 3 Periods to Close
  - 11 Payments to Deposit
  - 8 Invoices that are Overdue

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# TOP 10 CD-RW DRIVES

Visit [find.pcworld.com/28701](http://find.pcworld.com/28701) for reviews of all products tested this month and ranked in this chart.

FIVE NEW CD-RW drives debut on our chart this month—four that write to CD-R media at speeds up to 40X, and one, from Benq, at speeds up to 32X. The new models reflect the rapidly changing CD-RW drive market; just six months ago, 24X drives were the norm. TDK's VeloCD 40/12/48 replaces

its predecessor, the 32/10/40, in the number one spot. CenDyne's 40X update also fares well, landing at number three. Plextor's PlexWriter 40/12/40A is the only 40X model to top out at 24X when writing audio CDs, a step the company says it took to guarantee the quality of audio CD recordings. ►

|    | CD-RW DRIVE                                                                                                               | Street price (4/29/02) | Overall rating | Performance/ support policies | CD-R write speed for 650MB/ CD-RW write speed for 100MB (min:sec) | Comments                                                                                                                                                                                                                                                                                                                                                                                       |
|----|---------------------------------------------------------------------------------------------------------------------------|------------------------|----------------|-------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | <b>Best Buy</b> TDK VeloCD 40/12/48 <b>NEW</b><br><a href="http://find.pcworld.com/28284">find.pcworld.com/28284</a>      | \$135                  | 88             | Outstanding/ Very good        | 3:15/1:08                                                         | <b>FEATURES:</b> 40X/12X/48X, <sup>1</sup> IDE, internal, 2MB buffer, <sup>2</sup> Ahead Nero Burning ROM 5.5 and InCO 3.24, one-year warranty, 10.5-hour daily toll-free support. <b>SUMMARY:</b> This drive turned in the best write speed we've seen on our CO-R tests (we tested the Sanyo drive mechanism); it replaces last month's number one, the VeloCD 32/10/40. (★★★★☆)             |
| 2  | <b>Best Buy</b> LG Electronics GCE-8320B <b>NEW</b><br><a href="http://find.pcworld.com/25444">find.pcworld.com/25444</a> | \$110                  | 83             | Very good/ Very good          | 3:39/1:21                                                         | <b>FEATURES:</b> 32X/10X/40X, <sup>1</sup> IDE, internal, 8MB buffer, <sup>2</sup> Roxio Easy CO Creator 5.1 and OirectCO 5.1, one-year warranty, 13-hour weekday and 8-hour Saturday toll-free support. <b>SUMMARY:</b> Offers excellent documentation, including manuals for both drive and software. Moves up one spot from last month. (★★★★☆ Jun 02)                                      |
| 3  | CenDyne Lightning III LTR-40125S <b>NEW</b><br><a href="http://find.pcworld.com/28283">find.pcworld.com/28283</a>         | \$130                  | 82             | Outstanding/ Fair             | 3:23/1:06                                                         | <b>FEATURES:</b> 40X/12X/48X, <sup>1</sup> IDE, internal, 2MB buffer, <sup>2</sup> Ahead Nero Burning ROM 5.5 and InCO 3.2, one-year warranty, 9-hour weekday and 4-hour Saturday support (calls are not toll-free). <b>SUMMARY:</b> Not the fastest 40X performer we've seen—but its CO-R performance is only 8 seconds slower than our number one Best Buy. (★★★★☆)                          |
| 4  | Lite-On 40x12x48 CD-RW<br><a href="http://find.pcworld.com/25442">find.pcworld.com/25442</a>                              | \$95                   | 82             | Very good/ Fair               | 3:25/1:09                                                         | <b>FEATURES:</b> 40X/12X/48X, <sup>1</sup> IDE, internal, 2MB buffer, <sup>2</sup> Ahead Nero Burning ROM 5.5 and InCO 3.2, one-year warranty, 9-hour weekday support (calls are not toll-free). <b>SUMMARY:</b> The software bundle is limited, and the documentation is much thinner than we'd like to see, but a \$35 price drop makes this drive a good value. (★★★★☆ Jun 02)              |
| 5  | Sony CRX195A1 <b>NEW</b><br><a href="http://find.pcworld.com/28281">find.pcworld.com/28281</a>                            | \$150                  | 82             | Outstanding/ Very good        | 3:16/1:06                                                         | <b>FEATURES:</b> 40X/12X/48X, <sup>1</sup> IDE, internal, 2MB buffer, <sup>2</sup> B's Recorder Gold 3.23 and Clip Wizard 3.24, one-year warranty, 12-hour weekday and 12-hour Saturday toll-free support. <b>SUMMARY:</b> Speedy performer on both our CO mastering and packet-writing tests; also had the fastest time on our digital audio extraction test. (★★★★☆)                         |
| 6  | Benq 3210 CD-RW <b>NEW</b><br><a href="http://find.pcworld.com/28282">find.pcworld.com/28282</a>                          | \$110                  | 80             | Very good/ Fair               | 3:41/1:15                                                         | <b>FEATURES:</b> 32X/10X/40X, <sup>1</sup> IDE, internal, 2MB buffer, <sup>2</sup> Ahead Nero Burning ROM 5.5 and InCO 3.22, one-year warranty, 12-hour weekday toll-free support. <b>SUMMARY:</b> This is the first model we've tested from the company formerly known as Acer; the drive offers middle-of-the-pack price and performance. (★★★★☆)                                            |
| 7  | Yamaha CRW3200EZ LightSpeed3<br><a href="http://find.pcworld.com/19461">find.pcworld.com/19461</a>                        | \$150                  | 78             | Good/ Fair                    | 4:09/1:16                                                         | <b>FEATURES:</b> 24X/10X/40X, <sup>1</sup> IDE, internal, 8MB buffer, <sup>2</sup> Ahead Nero Burning ROM 5.5 and InCO 2.31, one-year warranty, 9-hour weekday and 7-hour Saturday toll-free support. <b>SUMMARY:</b> An excellent software bundle (including Adobe Photo Deluxe 4) helps keep this aging yet pricey drive competitive on the chart; price falls \$25. (★★★★☆ Mar 02)          |
| 8  | QPS Que Internal 32x10x40x CD-RW<br><a href="http://find.pcworld.com/24063">find.pcworld.com/24063</a>                    | \$125                  | 77             | Very good/ Fair               | 3:37/1:19                                                         | <b>FEATURES:</b> 32X/10X/40X, <sup>1</sup> IDE, internal, 2MB buffer, <sup>2</sup> Ahead Nero Burning ROM 5.5 and InCO 3.21, one-year warranty, 9-hour weekday support (calls are not toll-free). <b>SUMMARY:</b> Offers good performance for a moderate price, but QPS's support policies are mediocre. Price sheds \$25 this month. (★★★★☆ May 02)                                           |
| 9  | Plextor PlexWriter 40/12/40A <b>NEW</b><br><a href="http://find.pcworld.com/26281">find.pcworld.com/26281</a>             | \$150                  | 76             | Very good/ Fair               | 3:26/1:20                                                         | <b>FEATURES:</b> 40X/12X/40X, <sup>1</sup> IDE, internal, 4MB buffer, <sup>2</sup> Roxio Easy CO Creator 5.1 and OirectCO 5.1, one-year warranty, 10-hour weekday toll-free support. <b>SUMMARY:</b> This model was quick writing CO-Rs, but mediocre at writing to CO-RW media and extracting digital audio. Also, this is the only 40X drive to limit the write speed for audio COs. (★★★★☆) |
| 10 | Buslink RW4048<br><a href="http://find.pcworld.com/26141">find.pcworld.com/26141</a>                                      | \$140                  | 76             | Outstanding/ Fair             | 3:25/1:08                                                         | <b>FEATURES:</b> 40X/12X/48X, <sup>1</sup> IDE, internal, 2MB buffer, <sup>2</sup> Ahead Nero Burning ROM 5.5 and InCO 3.2, one-year warranty, 9.5-hour weekday support (calls are not toll-free). <b>SUMMARY:</b> Ties Lite-On's inexpensive 40X drive in CO-R performance, but costs \$45 more. Documentation is thin, as is Buslink's technical support. (★★★★☆ Jun 02)                     |

**HOW WE TEST:** To gauge CO-ROM read performance, we time how long the drive takes to install Microsoft Office 2000 SBE (disc one). To determine CO-R write performance, we burn data to CO-R discs from an image file and on the fly. We evaluate digital audio extraction speed by extracting 320MB of musical tracks from an audio CO to our hard drive. We measure CO-RW performance by copying 100MB of files to a CO-RW disc, and then rewriting the same data to the same disc. Overall ratings are based on performance (35 percent), price (25 percent), features (20 percent), tech support policies (10 percent), and ease of installation (10 percent). See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings. <sup>1</sup> Vendor's speed ratings, listed in order: CO-R write/CD-RW write/CD-ROM read. <sup>2</sup> Except where noted, all drives use buffer underrun protection.

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# TOP 10 GRAPHICS BOARDS

Visit [find.pcworld.com/28621](http://find.pcworld.com/28621) for reviews of all products tested this month and ranked in this chart.

THIS MONTH, IT'S OUT with the old, in with the new, as cards based on NVidia's newest GeForce4 MX and GeForce4 Titanium lines supplant nearly all older GeForce cards. On the power side, VisionTek's Xtasy GeForce4 Ti 4400 earns the

coveted top power spot thanks to its speed and affordability. VisionTek also secures first place on the value side of the chart, with its Xtasy GeForce4 MX 440—the only card in the value category to provide dual-display support. ►

|                      | POWER GRAPHICS BOARD                                                                                                                 | Street price (4/20/02) | Overall rating | Image quality | Overall speed | Features rating | Comments                                                                                                                                                                                                                                                                                                                               |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------|---------------|---------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                    | <b>Best BUY</b> VisionTek Xtasy GeForce4 Ti 4400<br><a href="http://find.pcworld.com/28361">find.pcworld.com/28361</a> <b>NEW</b>    | \$250                  | 91             | Very good     | Outstanding   | Good            | <b>FEATURES:</b> NVidia GeForce4 Ti 4400 chip, 128MB of DDR SDRAM, 350-MHz RAMDAC; OVI-out, S-Video-out; color-calibration utility, software OVO player. <b>SUMMARY:</b> Almost as fast as GeForce4 Ti 4600-based cards (which came out slightly better in speed and image quality) and priced considerably lower. (★★★★☆)             |
| 2                    | PNY Verto GeForce4 Ti 4600<br><a href="http://find.pcworld.com/28362">find.pcworld.com/28362</a> <b>NEW</b>                          | \$385                  | 89             | Very good     | Outstanding   | Good            | <b>FEATURES:</b> NVidia GeForce4 Ti 4600 chip, 128MB of DDR SDRAM, 350-MHz RAMDAC; OVI-out, S-Video-out; color-calibration utility, Star Wars Star Fighter game. <b>SUMMARY:</b> Fastest card we tested this month. PNY offers a lifetime replacement warranty and 10 hours of weekday toll-free technical support. (★★★★☆)            |
| 3                    | VisionTek Xtasy GeForce4 Ti 4600<br><a href="http://find.pcworld.com/28363">find.pcworld.com/28363</a> <b>NEW</b>                    | \$385                  | 89             | Very good     | Outstanding   | Good            | <b>FEATURES:</b> NVidia GeForce4 Ti 4600 chip, 128MB of DDR SDRAM, 350-MHz RAMDAC; OVI-out, S-Video-in and -out; video editing software, software OVO player. <b>SUMMARY:</b> Great detail and excellent shadows in test games. Includes toll-free tech support for 11 hours every weekday and a lifetime warranty. (★★★★☆)            |
| 4                    | Hercules 3D Prophet FDX 8500 LE<br><a href="http://find.pcworld.com/28381">find.pcworld.com/28381</a> <b>NEW</b>                     | \$169                  | 87             | Good          | Very good     | Good            | <b>FEATURES:</b> ATI Radeon 8500 chip, 64MB of DDR SDRAM; 400-MHz RAMDAC; DVI-out, S-Video-out, composite-out; color-calibration utility, overclocking software, software DVD player. <b>SUMMARY:</b> The lowest-cost card on the power chart offers fast frame rates. Games looked dark and a couple lacked contrast. (★★★★☆)         |
| 5                    | ATI All-in-Wonder Radeon 8500DV<br><a href="http://find.pcworld.com/22801">find.pcworld.com/22801</a>                                | \$299                  | 82             | Good          | Very good     | Outstanding     | <b>FEATURES:</b> ATI Radeon 8500 chip, 64MB of DDR SDRAM, 400-MHz RAMDAC; OVI-out, dual-display, audio, S-Video-in and -out, composite-in and -out, IEEE 1394-in and -out; color-calibration utility, video editing software, software OVO player. <b>SUMMARY:</b> Works well for playing games and editing videos. (★★★★☆ May 02)     |
| VALUE GRAPHICS BOARD |                                                                                                                                      |                        |                |               |               |                 |                                                                                                                                                                                                                                                                                                                                        |
| 1                    | <b>Best BUY</b> VisionTek Xtasy GeForce4 MX 440<br><a href="http://find.pcworld.com/28561">find.pcworld.com/28561</a> <b>NEW</b>     | \$145                  | 95             | Outstanding   | Very good     | Average         | <b>FEATURES:</b> NVidia GeForce4 MX 440 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; NVview (dual-display support); software OVO player. <b>SUMMARY:</b> Excellent speed, crisp details, and vivid colors in test games. Supports NVidia's NVview technology so you can hook up two analog or digital displays in any combination. (★★★★☆) |
| 2                    | MSI G4MX440-T<br><a href="http://find.pcworld.com/28562">find.pcworld.com/28562</a> <b>NEW</b>                                       | \$120                  | 95             | Very good     | Very good     | Average         | <b>FEATURES:</b> NVidia GeForce4 MX 440 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; S-Video-out, composite-out; color-calibration utility, overclocking software, software OVO player, three games, seven demos. <b>SUMMARY:</b> Includes full versions of Aquanox, Sacrifice, and The Operative: No One Lives Forever games. (★★★★☆)     |
| 3                    | Gainward GeForce4 PowerPack Pro/600TV Golden Sample<br><a href="http://find.pcworld.com/28581">find.pcworld.com/28581</a> <b>NEW</b> | \$120                  | 93             | Very good     | Very good     | Average         | <b>FEATURES:</b> NVidia GeForce4 MX 440 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; S-Video-out, composite-out; overclocking software, software DVD player. <b>SUMMARY:</b> Smooth game play and vivid colors in test games, but Quake III looked somewhat jerky and had a yellowish tint. (★★★★☆)                                        |
| 4                    | EVGA E-GeForce4 MX 440<br><a href="http://find.pcworld.com/28601">find.pcworld.com/28601</a> <b>NEW</b>                              | \$120                  | 87             | Outstanding   | Very good     | Poor            | <b>FEATURES:</b> NVidia GeForce4 MX 440 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; S-Video-out; software OVO player. <b>SUMMARY:</b> A no-frills card that offers exceptional image quality and impressive speed, but little in the way of bundled extras. Fastest value card we tested this month. (★★★★☆)                              |
| 5                    | Gainward GeForce2 Ti/500 XP VIVO Golden Sample<br><a href="http://find.pcworld.com/17721">find.pcworld.com/17721</a>                 | \$130                  | 86             | Average       | Very good     | Good            | <b>FEATURES:</b> NVidia GeForce2 Ti chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; S-Video-in and -out, composite-in and -out; video editing software, software OVO player. <b>SUMMARY:</b> Fine speed performance for a previous-generation card. Look for prices to drop on this model as supplies dwindle. (★★★★☆ Feb 02)                 |

**HOW WE TEST:** We test graphics boards under Windows Millennium Edition. Our performance scores are based on tests that we evaluate on frame rate (70 percent) and image quality (30 percent). We use GT Interactive's Unreal Tournament, Id Software's Quake III Arena, Interplay's MOK2 Demo, Infogrames' Test Drive 6, and the Caligari TrueSpace 4.2 Benchmark for both performance and image-quality testing. We test graphics boards in a Dell Dimension 4100 Series with a 933-MHz Pentium III CPU and 128MB of PC133 SDRAM. To test each board, we use drivers supplied by the vendor. Overall rating is based on performance (65 percent for power boards, 42.5 percent for value boards), features (15 percent for power, 27.5 percent for value), price (10 percent for power, 20 percent for value), and support policies (10 percent). All boards are 4X AGP compatible. See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings.

## TOP 10 DIGITAL CAMERAS

Visit [find.pcworld.com/28141](http://find.pcworld.com/28141) for reviews of all products tested this month and ranked in this chart.

SONY AIMS FOR BOTH ENDS of the size and features spectrum this month. The \$899 CD Mavica MVC-CD400 takes the tenth spot on our chart, with a 3.13-inch CD-RW disc that can hold hundreds of shots and can play back on most optical drives. Regrettably, touchy navigation buttons made using the

camera annoying. Meanwhile, Sony's Cyber-shot DSC-P9 missed the chart. This tiny 4-megapixel takes sharp photos, but it's basically a point-and-shoot with few features for \$699.

Also missing the chart, the \$599 Kyocera Finecam S4 includes a few extras, but its battery life is too short. ►

|    | CAMERA: ABOVE \$500                                                                                       | Street price (4/26/02) | Overall rating | Image quality | Ease of use | Battery life/shots | Comments <sup>1</sup>                                                                                                                                                                                                                                                                                                                         |
|----|-----------------------------------------------------------------------------------------------------------|------------------------|----------------|---------------|-------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | <b>Best BUY</b> Canon PowerShot G2<br><a href="http://find.pcworld.com/14800">find.pcworld.com/14800</a>  | \$799                  | 86             | Outstanding   | Adequate    | Very good/348      | <b>FEATURES:</b> 4-megapixel resolution, 32MB CompactFlash media, 34mm-102mm focal range; USB and video output; 18.9 ounces. <b>SUMMARY:</b> Full-featured camera takes high-quality photos and has a long battery life. Includes a roomy storage card and swing-out viewfinder. A \$100 price drop moves it up the chart. (★★★★☆ Dec 01)     |
| 2  | <b>Best BUY</b> Nikon Coolpix 995<br><a href="http://find.pcworld.com/14801">find.pcworld.com/14801</a>   | \$599                  | 84             | Very good     | Good        | Very good/309      | <b>FEATURES:</b> 3.2-megapixel resolution, 16MB CompactFlash media, 38mm-152mm focal range; USB and video output; 16.2 ounces. <b>SUMMARY:</b> Offers a huge, sometimes intimidating list of features, including a swivel lens and custom buttons. Photos look very good, with fine detail. (★★★★☆ Dec 01)                                    |
| 3  | Sony Cyber-shot DSC-F707<br><a href="http://find.pcworld.com/23902">find.pcworld.com/23902</a>            | \$999                  | 84             | Very good     | Good        | Outstanding/404    | <b>FEATURES:</b> 5-megapixel resolution, 16MB Memory Stick media, 38mm-190mm focal range; USB and video output; 24.5 ounces. <b>SUMMARY:</b> Besides futuristic styling, this camera has a 5X optical zoom; it can shoot in dark rooms with or without flash. The electronic viewfinder is not as sharp or fast as we'd like. (★★★★☆ May 02)  |
| 4  | Nikon Coolpix 5000<br><a href="http://find.pcworld.com/23881">find.pcworld.com/23881</a>                  | \$1099                 | 83             | Very good     | Good        | Very good/332      | <b>FEATURES:</b> 5-megapixel resolution, 32MB CompactFlash media, 28mm-85mm focal range; USB and video output; 15 ounces. <b>SUMMARY:</b> Relatively small and light for a 5-megapixel camera, the Coolpix 5000 offers a huge selection of controls, but it's not the quickest or easiest camera to use. (★★★★☆ May 02)                       |
| 5  | Sony Cyber-shot DSC-S85<br><a href="http://find.pcworld.com/14803">find.pcworld.com/14803</a>             | \$699                  | 83             | Good          | Good        | Outstanding/427    | <b>FEATURES:</b> 4-megapixel resolution, 16MB Memory Stick media, 34mm-102mm focal range; USB and video output; 16.4 ounces. <b>SUMMARY:</b> Well designed and easy to use, with extremely long battery life. Photos looked a bit oversaturated, however, and the shutter button is touchy. Drops \$100 this month. (★★★★☆ Dec 01)            |
| 6  | Olympus Camedia E-20N<br><a href="http://find.pcworld.com/23901">find.pcworld.com/23901</a>               | \$1999                 | 83             | Good          | Outstanding | Outstanding/618    | <b>FEATURES:</b> 5-megapixel resolution, 32MB SmartMedia and CompactFlash (optional) media, 35mm-140mm focal range; USB and video output; 41.7 ounces. <b>SUMMARY:</b> A digital camera on steroids, the massive E-20N has through-the-lens viewing and well-organized controls for fast action and pleasurable shooting. (★★★★☆ May 02)      |
| 7  | Olympus D-40 Zoom<br><a href="http://find.pcworld.com/19143">find.pcworld.com/19143</a>                   | \$679                  | 82             | Good          | Good        | Very good/369      | <b>FEATURES:</b> 4-megapixel resolution, 16MB SmartMedia card, 35mm-98mm focal range; USB and video output; 8.8 ounces. <b>SUMMARY:</b> One of the smallest 4-megapixel cameras available, the D-40 is stylish and relatively easy to use; a good choice for sophisticated traveling photographers. (★★★★☆ Mar 02)                            |
| 8  | Canon PowerShot S40<br><a href="http://find.pcworld.com/19141">find.pcworld.com/19141</a>                 | \$699                  | 82             | Outstanding   | Adequate    | Adequate/173       | <b>FEATURES:</b> 4-megapixel resolution, 16MB CompactFlash media, 35mm-105mm focal range; USB and video output; 11.1 ounces. <b>SUMMARY:</b> The stylish PowerShot S40 takes beautifully sharp and vivid photos. A couple of controls can be confusing, however, and battery life is short. Price drops \$100 this month. (★★★★☆ Mar 02)      |
| 9  | Olympus Camedia C-4040 Zoom<br><a href="http://find.pcworld.com/16264">find.pcworld.com/16264</a>         | \$799                  | 79             | Good          | Good        | Adequate/222       | <b>FEATURES:</b> 4-megapixel resolution, 16MB SmartMedia card, 35mm-105mm focal range; USB and video output; 14.1 ounces. <b>SUMMARY:</b> Solidly designed, general-purpose camera keeps to the basics. Offers fast f1.8 lens, automatic and manual exposure modes; makes Quick-Time movies with sound. Good for business use. (★★★★☆ Jan 02) |
| 10 | Sony CD Mavica MVC-CD400<br><a href="http://find.pcworld.com/28121">find.pcworld.com/28121</a> <b>NEW</b> | \$899                  | 78             | Good          | Adequate    | Very good/355      | <b>FEATURES:</b> 4-megapixel resolution, 156MB CD-RW media, 34mm-102mm focal range; USB and video output; 21.5 ounces. <b>SUMMARY:</b> Rewritable CD media gives this camera massive and relatively cheap storage capacity. It's bulky and has no optical viewfinder, but the LCD screen, at 2.5 inches, is spacious. (★★★★☆)                 |

**HOW WE TEST:** Overall rating is based on price (30 percent), picture quality (20 percent), ease of use (15 percent), features (15 percent), battery life (10 percent), and support (10 percent). For all ratings, higher is better. To gauge picture quality, we take a series of shots, with and without flash, at 640 by 480 resolution and at the camera's highest resolution. We photograph a complex still life and a mannequin to see how well each camera captures details and subtle colorings such as skin tones. A panel of judges reviews the on-screen and printed photos and assigns image-quality scores, which we average. Camera weights include batteries. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings. <sup>1</sup> Resolutions are expressed in effective pixels; focal range is identified as 35mm equivalent.

# MORE REVIEWS

MISSED AN ISSUE OF *PC World*, or passed your copy along to a friend? Here's a recap of other *Top 100* topics from previous issues. To read reviews of the products ranked on these charts, go online and type in the *PC World* Find-It URL at the

top of each chart (for example, [find.pcworld.com/25421](http://find.pcworld.com/25421) for products listed on the *Top 10 LCD Monitors* chart). Next month's *Top 100* section will include coverage of color laser printers and of digital cameras priced at under \$500. ■



**THE PALM M130's features**  
Include a color screen, an expansion slot for a Secure Digital card, and rechargeable batteries—all for a reasonable price.

**ASIDE FROM ITS snappy blue-and-silver case, the Nikon Coolpix 2500's most distinctive feature is its pivoting lens, which folds into the camera's body for storage.**



## PRINTERS

[find.pcworld.com/27901](http://find.pcworld.com/27901)

### MONOCHROME LASER PRINTERS From the June 2002 issue

**1** **Best BUY** Brother HL-1440  
[find.pcworld.com/11581](http://find.pcworld.com/11581)

**2** Samsung ML-1450  
[find.pcworld.com/24241](http://find.pcworld.com/24241)

**3** Lexmark E320  
[find.pcworld.com/17421](http://find.pcworld.com/17421)

**4** HP LaserJet 1000  
[find.pcworld.com/17404](http://find.pcworld.com/17404)

**5** Samsung ML-1250  
[find.pcworld.com/17401](http://find.pcworld.com/17401)

**1** **Best BUY** Xerox DocuPrint N2125  
[find.pcworld.com/11600](http://find.pcworld.com/11600)

**2** Samsung ML-1651N  
[find.pcworld.com/17402](http://find.pcworld.com/17402)

**3** HP LaserJet 4100N  
[find.pcworld.com/11661](http://find.pcworld.com/11661)

**4** Lexmark T522dn  
[find.pcworld.com/18342](http://find.pcworld.com/18342)

**5** Minolta-QMS PagePro 9100 N  
[find.pcworld.com/25861](http://find.pcworld.com/25861)

## MONITORS

[find.pcworld.com/25421](http://find.pcworld.com/25421)

### 15-INCH LCD MONITORS From the June 2002 issue

**1** **Best BUY** NEC MultiSync LCD1550X  
[find.pcworld.com/24881](http://find.pcworld.com/24881)

**2** **Best BUY** Sharp LL-T15V1  
[find.pcworld.com/24921](http://find.pcworld.com/24921)

**3** CTX PV520A  
[find.pcworld.com/24841](http://find.pcworld.com/24841)

**4** Iiyama Pro Lite 3835UT  
[find.pcworld.com/24801](http://find.pcworld.com/24801)

**5** Hewlett-Packard L1520  
[find.pcworld.com/24783](http://find.pcworld.com/24783)

**6** Eizo Nanao FlexScan L365  
[find.pcworld.com/24901](http://find.pcworld.com/24901)

**7** ADI A600  
[find.pcworld.com/24941](http://find.pcworld.com/24941)

**8** Samsung SyncMaster 570vTFT  
[find.pcworld.com/24961](http://find.pcworld.com/24961)

**9** Benq FP581  
[find.pcworld.com/24981](http://find.pcworld.com/24981)

**10** ViewSonic VE155  
[find.pcworld.com/24861](http://find.pcworld.com/24861)

## PDA's

[find.pcworld.com/26041](http://find.pcworld.com/26041)

### PERSONAL DIGITAL ASSISTANTS From the June 2002 issue

**1** **Best BUY** Casio Cassiopeia E-200  
[find.pcworld.com/21585](http://find.pcworld.com/21585)

**2** Palm M515  
[find.pcworld.com/26021](http://find.pcworld.com/26021)

**3** Compaq iPaq Pocket PC H3850  
[find.pcworld.com/21586](http://find.pcworld.com/21586)

**4** Sony Clie PEG-T615C  
[find.pcworld.com/25981](http://find.pcworld.com/25981)

**5** HP Jornada 565  
[find.pcworld.com/21583](http://find.pcworld.com/21583)

**1** **Best BUY** HandEra 330  
[find.pcworld.com/21564](http://find.pcworld.com/21564)

**2** Handspring Visor Neo  
[find.pcworld.com/21563](http://find.pcworld.com/21563)

**3** Sony Clie PEG-S360  
[find.pcworld.com/25961](http://find.pcworld.com/25961)

**4** Handspring Visor Pro  
[find.pcworld.com/21562](http://find.pcworld.com/21562)

**5** Palm M130  
[find.pcworld.com/26002](http://find.pcworld.com/26002)

## DIGITAL CAMERAS

[find.pcworld.com/26081](http://find.pcworld.com/26081)

### DIGITAL CAMERAS UNDER \$500 From the June 2002 issue

**1** **Best BUY** Toshiba PDR-M71  
[find.pcworld.com/17961](http://find.pcworld.com/17961)

**2** **Best BUY** Nikon Coolpix 2500  
[find.pcworld.com/25761](http://find.pcworld.com/25761)

**3** Olympus Camedia C-3020 Zoom  
[find.pcworld.com/25702](http://find.pcworld.com/25702)

**4** Toshiba PDR-M25  
[find.pcworld.com/20862](http://find.pcworld.com/20862)

**5** Sony Cyber-shot DSC-P71  
[find.pcworld.com/25701](http://find.pcworld.com/25701)

**6** Fujifilm FinePix 2600 Zoom  
[find.pcworld.com/17965](http://find.pcworld.com/17965)

**7** Nikon Coolpix 885  
[find.pcworld.com/19142](http://find.pcworld.com/19142)

**8** HP Photosmart 318  
[find.pcworld.com/14806](http://find.pcworld.com/14806)

**9** Kodak DX3900 Zoom  
[find.pcworld.com/17962](http://find.pcworld.com/17962)

**10** Konica KD-300Z  
[find.pcworld.com/22761](http://find.pcworld.com/22761)

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# KINGSTON TECHNOLOGY: THE MEMORY EXPERTS

[www.shop.kingston.com](http://www.shop.kingston.com)

Are you feeling a bit lost in your own digital universe? Do you know where to go when you've tapped your handheld PC's memory, or when you've run out of space on your digital camera?

Do you know who to trust with that MP3 library you can't live without?

As the world's largest third-party memory manufacturer, Kingston Technology Company Inc. has for years been helping PC enthusiasts upgrade the RAM in their PCs with demonstrations and system-specific memory guides at its retail Web site, [www.Shop.Kingston.com](http://www.Shop.Kingston.com).

Now many mobile users, from digital shutterbugs to PDA-wielding business travelers, are turning to [Shop.Kingston.com](http://Shop.Kingston.com) for advice on their Flash and other memory upgrades.

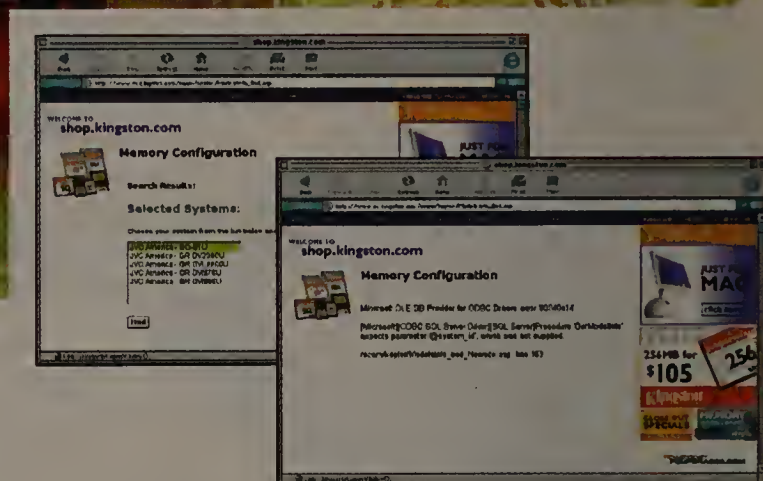
[Shop.Kingston.com](http://Shop.Kingston.com)'s extensive searchable database takes the guesswork out of finding the right upgrade for digital devices, as well as PCs, Macs, and printers. A customer can use the site's unique and powerful Memory Configurator to find his system, and choose from a list of matching available upgrades.



"If you're looking to get more digital music on your MP3 player, the Memory Configurator at [Shop.Kingston.com](http://Shop.Kingston.com) can lead you to a 258MB CompactFlash upgrade that stores up to 100 songs," says Jason Jacobi, a Kingston spokesman.

"Or let's say you're looking for an SD upgrade card to store more photos on your new JVC MiniDV camera," Jacobi adds. "[Shop.Kingston.com](http://Shop.Kingston.com) is going to have the 128MB SecureDigital Card you're looking for."

And shoppers can trust the Memory Selector to direct them only to those memory modules that are compatible with their systems. (Kingston actually guarantees the compatibility of all memory found through the Memory Selector.)



## MEMORY YOU CAN TRUST, PRICES YOU'LL LOVE

Kingston each year builds and tests more than two million customized modules for hardware manufacturers and systems developers. Many of the world's leading PC makers install Kingston memory in their base systems.

Now Kingston is bringing that same quality memory, and the same guarantees, to individual users of mobile devices, at factory-direct prices.

And Kingston supports even novice upgraders with free tutorials and installation guides for Flash memory and any other type of module the company sells. [Shop.Kingston.com](http://Shop.Kingston.com) also provides detailed Adobe Acrobat PDF-formatted installation guides from leading PC manufacturers.

Kingston's Jacobi says first-time memory buyers will have no trouble learning to install their upgrades.

"At [Shop.Kingston.com](http://Shop.Kingston.com)," Kingston says, "we provide an animated installation guide that takes the anxiety out of the installation process for users at any level. It makes upgrading quick and easy."

Even if a customer has trouble with his upgrade, he can always call Kingston at 800-435-0640 and consult with a live Kingston memory expert, 24 x 7.

With its extensive support for first-time upgraders and 24-hour customer service, Kingston is bringing its memory products and high-level support to users of nearly every kind of mobile device or desktop PC. As a leading manufacturer, Kingston can provide upgrades for printers, iMacs, digital cameras, and the latest PDAs.

"Our size, reputation, and knowledge base," Jacobi says, "has helped make [Shop.Kingston.com](http://Shop.Kingston.com) the de facto Internet Memory Center for all of the devices in your digital universe."





## COMMITTED TO MEMORY

fast

easy

secure

100% compatible

LIMITED TIME OFFER

**FREE**  
NEXT DAY  
SHIPPING\*

## Welcome to the Memory Center of Your Digital Universe

- Support for all leading digital devices
- Memory upgrades built to perform
- Easy-to-use Product Configurator
- Award winning service and support

For more details, visit [www.shop.kingston.com/digitaluniverse](http://www.shop.kingston.com/digitaluniverse)

 **Kingston**  
TECHNOLOGY



# CRUCIAL MEMORY:

## CRUCIAL.COM EXPANDS FLASH MEMORY OPTIONS

[www.crucial.com](http://www.crucial.com)

It was hard to believe, a year or two ago, that our \$500-plus PDAs or digital cameras would ever need more memory. But as users adapt to their new filmless, wireless world, they're looking to add flash memory to their gadgets and productivity tools quickly, and without any hassle.

Few online vendors, however, are leading flash memory buyers to the exact memory cards they require. They often force their customers to sift through long and confusing lists of memory cards, sometimes from unnamed manufacturers.

Crucial.com is an exception. As a division of Micron, one of the world's leading memory manufacturers, Crucial.com's reputation for quality is now making it a go-to site for flash memory purchases. Crucial.com's search tools, articles about flash memory, and glossary of terms help make buying flash memory easy and affordable.

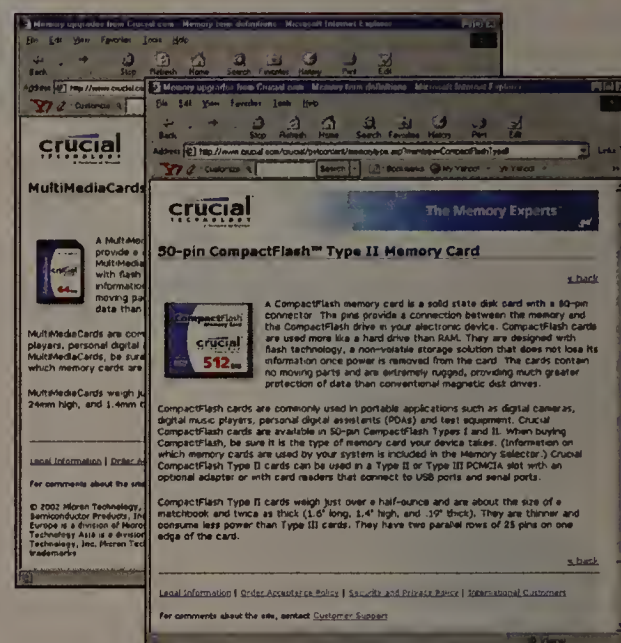
And Crucial recently expanded its flash memory line to include higher-density CompactFlash cards and a wide range of MultiMediaCards, which are commonly found in digital still and video cameras, PDAs, and cell phones.



### GUARANTEED COMPATIBILITY

Crucial.com guarantees the compatibility of every flash memory card purchased through the site's Memory Selector<sup>SM</sup>, an all-in-one search tool for finding exactly the right memory for a particular system.

With the Memory Selector, Crucial.com shoppers simply enter their electronic device's make and model (or other information), and the site returns a list of memory upgrades that are guaranteed to work with that system. Flash memory buyers can also search the site by standard memory type, such as "CompactFlash" or "MultiMediaCard."



And all of Crucial.com's memory products are mechanically and electronically compliant with stringent industry standards.

### DESIGNED WITH THE CUSTOMER IN MIND

For shoppers unsure about using flash memory upgrades, or those who simply want to know more about how their devices work, Crucial.com has posted articles about flash memory upgrades and their benefits. The site also includes a glossary of terms for buyers of all types of memory.

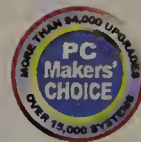
"Our customers know they're getting the best flash memory available, at great prices," says Cynthia Gibson, product marketing manager at Crucial.com.

Crucial.com backs all of its flash memory with a five-year warranty and free technical support through its live-chat Expert Line, or via e-mail and a toll-free telephone number. Crucial.com also keeps its customers' personal data safe and secure. The site's Safe Shopping Guarantee promises shoppers that their transactions are encrypted and personal information kept completely confidential.

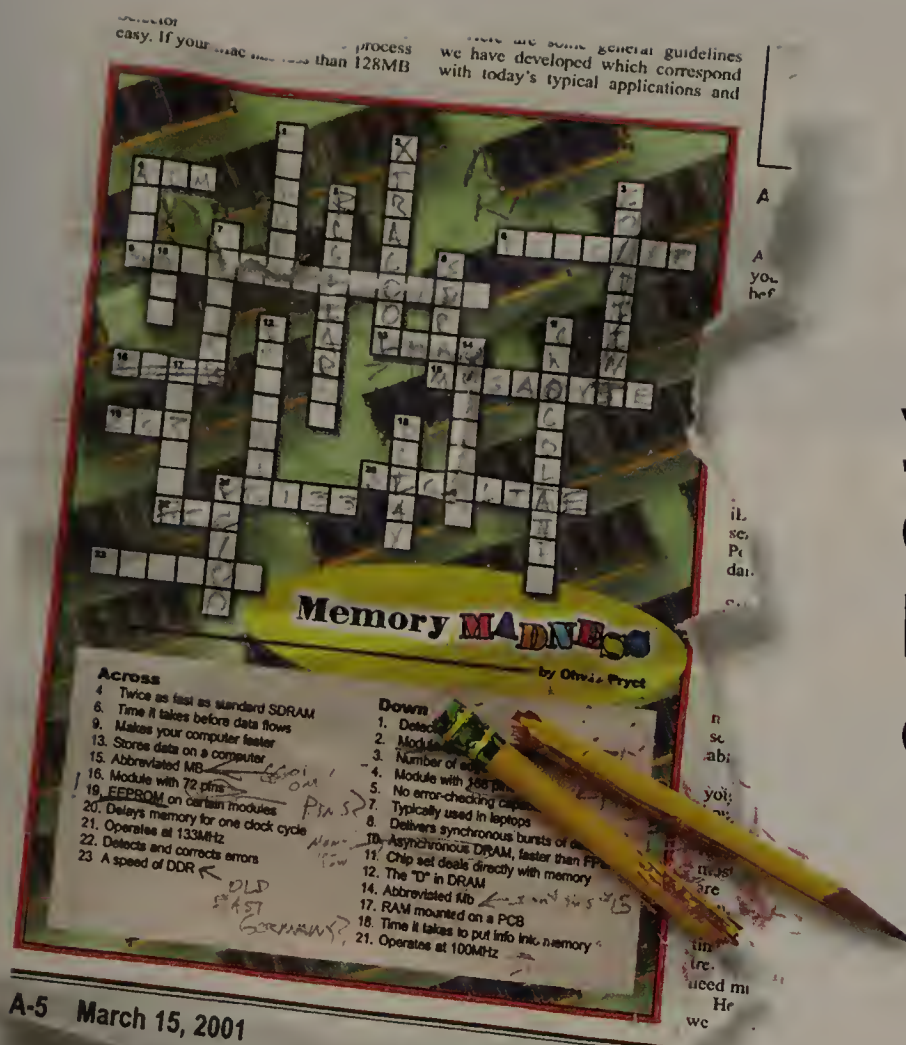
Crucial.com already sells over 94,000 memory upgrades for more than 15,000 computers, peripherals, and handheld devices. And the site, according to Crucial.com's Gibson, is expanding its flash memory offerings to meet its customers' growing demands.

"We became a leader in the memory upgrade market because our customers knew they could count on us for only the highest-quality memory," says Gibson. "But our customers also know that we will always grow our product line in order to meet all of their memory upgrade needs."



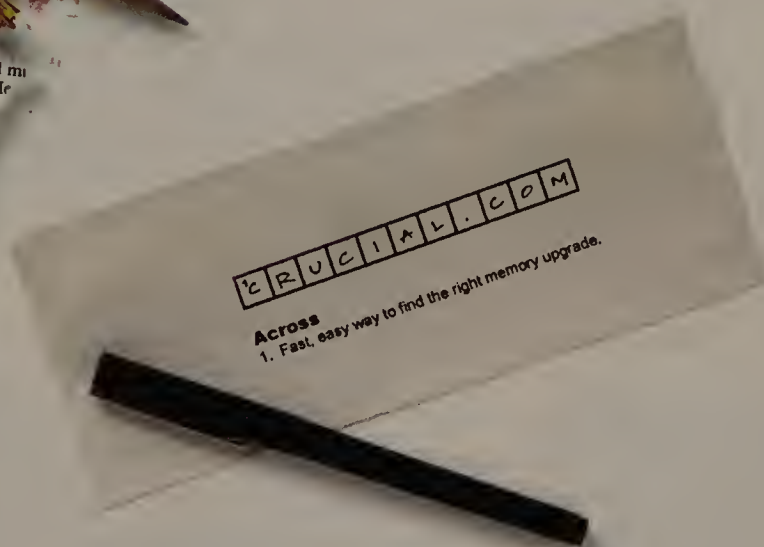


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# PC AMERICA: INVENTORY MANAGEMENT AT POINT OF SALE

[www.pcamerica.com](http://www.pcamerica.com)

While many motorists in Dimondale, Mich. say the family-owned Windmill Truck Stop is a home away from home, its controller, Kevin Edelmann, says it's been more like a house of accounting horrors. Besides monitoring retail fuel sales in the truck stop's "truckers only" area, he also has to keep an eye on commuters' and travelers' purchases in the king-sized complex's convenience store, family restaurant, motel, and auto service center. "Keeping track of all of that inventory has been a nightmare," Edelmann says.

The Point of Sale (POS) system that the Windmill had been using since 1982 did a fine job of ringing up sales, but it couldn't tell store managers anything about what was on the shelf. "The system only broke sales down by department," Edelmann says. "So it couldn't tell the difference between a tube of toothpaste and a bottle of shampoo."

Edelmann found only a few POS solutions that were easy to use, Microsoft Windows-based, and able to support multiple input devices. And none of them could manage the 20,000-plus items in the Windmill's convenience store and restaurant. "We desperately needed a solution that could bring all of these components of our business together," he says.



## PC AMERICA

Things finally turned around at the Windmill once Edelmann deployed PC America's Cash Register Express (CRE 2000), a Windows-based POS program that works with ordinary PCs and peripherals, as well as barcode scanners, receipt printers, and pole displays (which show charges at the checkout counter). Now all of the Windmill's cashiers can use touch screens and barcode scanners to enter orders and update inventory. And setting up CRE 2000 could not be easier, says Edelmann. "PC America did



The home page for PC America speeds you to the point-of-sale products you need.

an excellent job pulling all of the hardware together initially. But the great thing about their software is that I can grab any component I want off the shelf and throw it together in no time. This is one slick program."

The Windmill has processed more than half a million transactions with CRE 2000 and PC America's Restaurant Pro Express (RPE 2000) since October 1999. And Edelmann predicts that PC America will continue to develop the software he needs to keep things running smoothly. "PC America is constantly improving upon their products," he says.

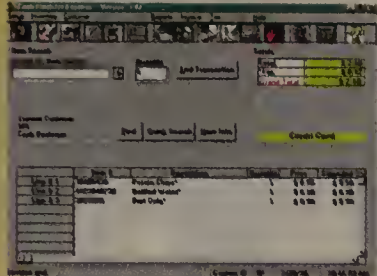
Now PC America is helping retailers like the Windmill to move beyond the sale itself to increase revenues. A new feature in CRE 2000 gives businesses the ability to print coupons on the bottom of sales receipts on an Epson TM-T88II receipt printer. They can use the coupons to advertise specials on slow business days (e.g., "10 Percent Off All Purchases Every Tuesday"), or to give their customers discounts on overstock items (e.g., "Get a Free Six-Pack of Pepsi on Your Next Visit").

CRE 2000's couponing feature promises retailers an excellent route to a crucial dimension in retail sales. "Repeat business is the most important aspect of any business," says PC America's president, Howard Gosman. "With this addition to our POS package, we are giving our customers a quick and easy-to-use method for creating it."



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All PC America Software requires Microsoft Windows. The software was written in Visual Basic using Microsoft Access Files. The source code is available.

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# HERE'S HOW

EDITED BY DENNIS O'REILLY AND ERIC DAHL



## WINDOWS TIPS

SCOTT DUNN

### Show Windows' Control Panel Who's in Charge

**ALL  
Versions**

THE CONTROL PANEL is supposed to be Windows' command central for changing your computer's settings. Instead, it's a confusing mix of wizards and dialog boxes, with settings you never change alongside those you probably tweak quite often. Windows XP's Control Panel is a bit more organized: It groups icons into categories and provides tasks within each. (You can also use the traditional Control Panel view in XP if you wish.) Unfortun-

nately, if you already know which Control Panel applet you want to open, XP's new arrangement only means more clicking. These tips will let you tailor Control Panel in any version of Windows to suit your own inimitable style.

**The Microsoft approach:** Microsoft's own Control Panel customization options may meet your needs. Windows 2000, Me, and XP let you turn Control Panel into a cascading submenu off the Start•Settings menu. In Windows XP, right-click the

taskbar, choose *Properties*, and select the *Start Menu* tab. Click *Customize*, select the *Advanced* tab, and then choose *Display as a menu* under 'Start menu items'. In Windows 2000 and Me, right-click the taskbar, choose *Properties*, click the *Advanced* tab (if necessary), and select *Expand Control Panel* under 'Start Menu and Taskbar'. Click OK until all dialog boxes are closed. If you use Win 98, see "The made-from-scratch approach" on the facing page.

You can still view the Control Panel icons in a window: Click *Start•Settings*, and then either double-click the *Control Panel* menu item or right-click it and select *Open* or *Explore*. You can customize this window as you would any folder: Click the *View* menu and choose *Icons*, *List*, *Details*, or whichever view you prefer.

**The instant diet plan:** You can't add icons to Control Panel, rename icons, or change their look, but you *can* remove icons that you don't want. Choose *Start•Find•Files or Folders* (in Windows 98), *Start•Search•For Files or Folders* (in Windows 2000 and Me), or *Start•Search* (in Windows XP). Enter *\*.cpl* in the first text box in the left pane, select your hard drive in the 'Look in' box, and click *Find Now* or *Search*. This finds the Control Panel files in your System or System32 folder. To remove one of them, simply open Explorer or any folder window and drag the file to another folder.

The names of the files aren't always obvious, however. You may have to open a few different files by double-clicking their icons before you find the one you want to remove. For example, when you double-click 'prefscpl.cpl', it opens the RealPlayer Preferences dialog box. Moving that .cpl file removes the RealPlayer icon from Control Panel. (Naturally, this example applies only if you have installed

## 156 WINDOWS TIPS

Add, remove, or alter Windows' Control Panel shortcuts—or get a new view with the Visual Control Panel freebie.

## 160 INTERNET TIPS

Find your place on the Web with AOL's free and easy Hometown service; keep RealOne from reassociating your files.

## 162 STEP-BY-STEP

Recoup hard-drive space lost to file clutter by using the disk-maintenance utilities inside Windows.

## 164 HARDWARE TIPS

Does your PC need a muffler? Follow these steps to bring a little more peace and quiet to your workspace.

## 166 ANSWER LINE

The boot-floppy solution to crashes in Windows XP and 2000; customize your Send To menu; the one-click way to close all programs; move your Outlook settings to a new PC.

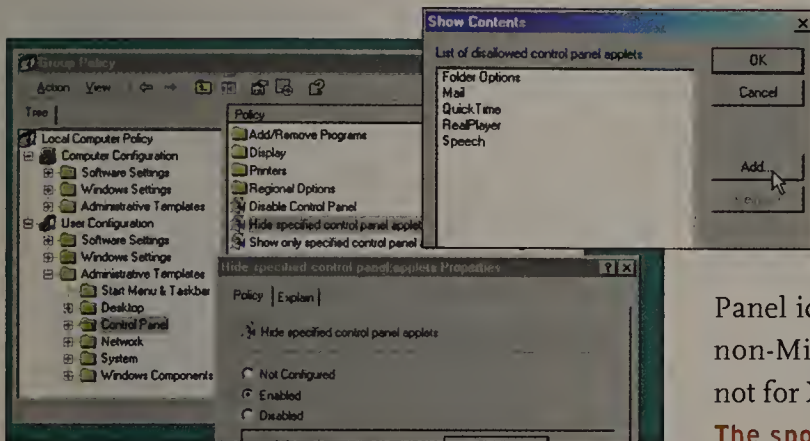


FIGURE 1: INSTANTLY HIDE Control Panel icons by using the Group Policy Editor.

RealPlayer.) This removal method works only for third-party icons in Windows XP, however. The operating system's built-in icons automatically restore themselves to Control Panel when moved.

Note that the 'main.cpl' file corresponds to several different Control Panel icons, including Fonts, Keyboard, Mouse, and Printers. If you move this file, you get rid of all of those icons.

A simple way to remove Control Panel icons in Windows XP or Windows 2000 is to use the Group Policy editor: Choose *Start*•*Run*, type **gpedit.msc**, and press **<Enter>**. Use the tree on the left to navigate to *Local Computer Policy*\User Configuration\Administrative Templates\Control Panel. With Control Panel selected in the left pane, double-click *Hide specified Control Panel applets* in the right pane. In the dialog box, select *Enabled* on the Policy tab and click the *Show* button. In the Show Contents dialog box, click *Add* (see **FIGURE 1**). Type the name of any applet icon as it appears in Control Panel and click *OK*. Repeat these last two steps for each icon you want to remove. When you've entered the names of all the icons you want to remove, double-check your spelling in the Show Contents dialog box. If you change

your mind about an item, select it and click *Remove* to take it off the list. Then click *OK* twice. This technique works for any Control Panel icon—even those added by non-Microsoft applications—but not for XP's category icons.

**The spot-reducing diet plan:** Windows' System Policy Editor lets you remove specific tabbed panels from certain Control Panel dialog boxes rather than removing the whole Control Panel icon.

In Windows 9x and Me, find *poledit.exe* on your Windows CD-ROM. If you can't locate it there, simply download the System Policy Editor from [www.microsoft.com/windows95/downloads](http://www.microsoft.com/windows95/downloads). Launch the program by double-clicking *poledit.exe* (or a shortcut to it). If you're asked for a template file, select the *admin.adm* file that comes with the download—or search for and select this file on your hard disk—and click *Open*. Choose *File*•*Open Registry*, and double-click the *Local User* icon to open the Local User Properties dialog box. Select the icon labeled *Control Panel*, and press the asterisk key (\*) on the numeric keypad to expand all branches under this icon. From here you can hide certain Control Panel dialog tabs and buttons. For example, under *System*, check *Restrict System Control Panel*; then in the list of check boxes at the bottom of the dialog box, check the items you want to hide, such as 'Hide Device Manager page' or 'Hide Virtual Memory button' (see **FIGURE 2**). When you're done, click *OK* and choose *File*•*Save*. The changes take effect immediately. To undo a change, just return to the dialog box, uncheck any items you checked, and save the Registry again.

In Windows 2000 and XP, choose *Start*•*Run*, type **gpedit.msc**, and press **<Enter>**. Navigate to *Local Computer Policy*\User Configuration\Administrative Templates\Control Panel. In the left pane, double-click *Control Panel* and select one of the folder icons that appear, to see its options in the right pane. For example, to hide the Settings tab in the Display Properties dialog box, select the *Display* icon on the left and double-click *Hide Settings tab* on the right. Select *Enabled* and click *OK*.

**The made-from-scratch approach:** It's useful to know how to remove icons from Control Panel and options from dialog boxes, but for the full customization experience, why not just create your own Control Panel, complete with custom items and names? Right-click the *Start* button and choose *Open*. Create a subfolder in this folder with a name such as **Control Panel** (mine is named **Contr&ols**, so I can open it by pressing **<Ctrl>**•**<Esc>**•**o**). Now open Control Panel. In Windows XP's Category view, you need to choose a category. Select the icons you want to ►

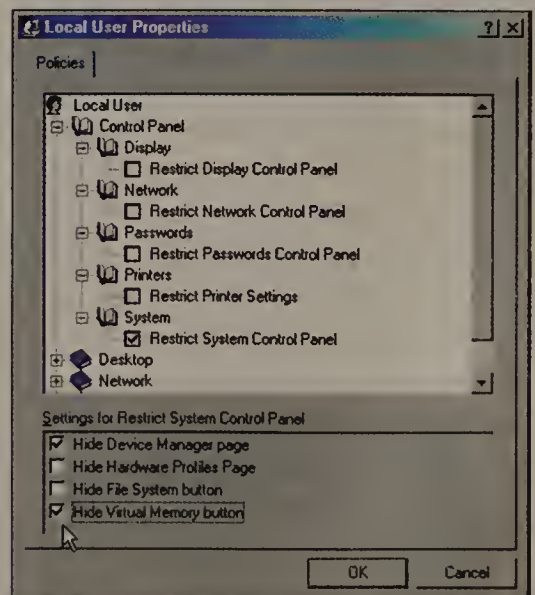


FIGURE 2: HIDE CONTROLS in some Control Panel dialog boxes via System Policy Editor.

include in your custom Control Panel, and right-drag them to your new folder. Release the mouse button and choose *Create Shortcut(s) Here*. You can rename the shortcuts if you wish to make them

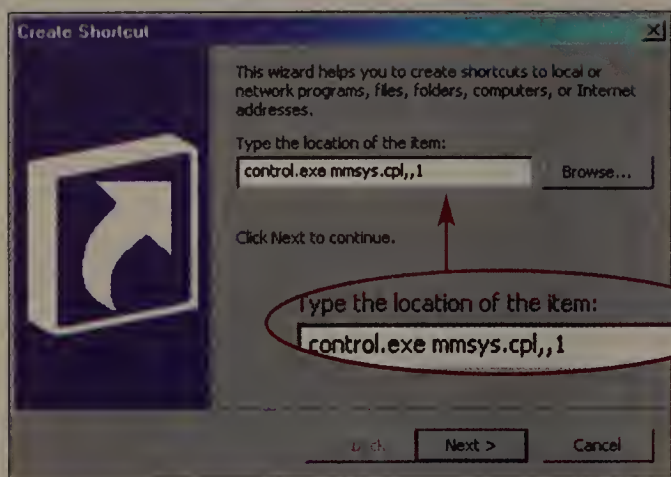


FIGURE 3: JUMP TO THE RIGHT TAB in your Control Panel dialog box by using a custom command line.

easy to access via keyboard shortcuts.

This approach lets you put shortcuts to any application, file, or folder—not just shortcuts to the standard Control Panel applets—in your new Control Panel folder.

**More-specific shortcuts:** You can also make a Control Panel utility with multiple tabbed panels open to the tab you want rather than to its default tab.

First, locate the .cpl file in Windows' System or System32 folder that corresponds to the Control Panel utility you want to open. Next, create a shortcut to the Control Panel icon you want by right-clicking in the folder window of your choice (such as your Start Menu\Control Panel folder, if you created one) and then choosing *New•Shortcut*. Type **control.exe**, followed by a space and the name of the .cpl file you want to open. Then type two commas and the number of the tab you want to open. Tabs are numbered left to right, starting at 0. For example, to create a shortcut that opens the Sounds and Multimedia Properties or the Sounds and Audio Devices Properties control panel with the second tab in front ('Sounds' in XP, and 'Audio' in 9x and Me), type **control.exe mmsys.cpl,,1** (see FIGURE 3). Click *Next*, type a name for your shortcut, and click *Finish*.

As mentioned in "The instant diet plan" above, some Control Panel icons don't exist as separate files but belong to a single file: **main.cpl**. To open the Language

or Input Locales panel of the Keyboard control panel, for example, you must type a command line such as **control.exe main.cpl,keyboard,1**. Omit the word *keyboard* to open the Mouse control panel.

Unfortunately, this technique doesn't work for all Control Panel icons. For example, you can't open a tab other than the default in the Mouse applet with this method, nor can you access some tabs on the Display Properties dialog box.

In Windows XP, the Display Properties icon (**desk.cpl**) uses both '1' and '2' to open the Screen Saver tab, but no number opens the Appearance tab. Hmmm.

**A different doorway to Control Panel:** If none of these approaches makes finding your Control Panel icons easier, check out the Visual Control Panel in this month's "Windows Toolbox."

## HIDE YOUR SHARED DRIVE

**ALL Versions**

IF YOU WANT TO share a drive or folder on a network with a few people while making it invisible to everyone else, just add a dollar sign to the end of the name you use for sharing. This also prevents large numbers of shared drives or folders from clogging Explorer windows on large networks. Right-click the drive or folder you want to share and choose *Properties*. Click the *Sharing* tab. If you're sharing the root of a drive in Windows XP, you have to click a warning link at this point. Select *Shared*

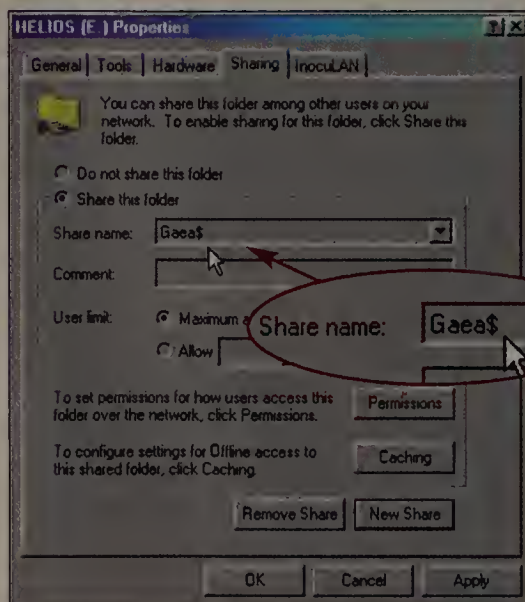


FIGURE 4: MAKE SHARED FOLDERS and drives Invisible in Network Neighborhood.

## WINDOWS TOOLBOX

### Find It Visually With Visual Control Panel

IF YOUR Windows Control Panel is overflowing with icons, you may need the Visual Control Panel. This small, simple program provides easy access to 12 or 13 common Control Panel icons (the number depends on your version of Windows) via a clickable picture. For example, click the monitor to open Display Properties, or click the keyboard to open Keyboard Properties. Makes sense, no? For items not represented in the picture, you can



either use your old Control Panel or select the applet from the *File•Other Items* menu. Visual Control Panel may or may not suit your style, but trying it out can't hurt—it's free! Go to [find.pcworld.com/26161](http://find.pcworld.com/26161) to download your copy.

As, *Share this folder*, or *Share this folder on the network*. In Windows 2000, click *New Share*. For 'Share name', type a name that will identify the folder or drive, and add \$ to the end. Click *OK* once or twice as needed (see FIGURE 4). Users won't be able to see this shared item in Network Neighborhood, but they can choose *Tools•Map Network Drive* and type the path to the drive using the universal naming convention: two back slashes (\\) followed by the server name, with the rest of the path defined by using single back slashes (\) as dividers—for example, **\\server\shared\folder\file**. ■

Send Windows-related questions and tips to [scott\\_dunn@pcworld.com](mailto:scott_dunn@pcworld.com). Windows Tips pays \$50 for published items. Scott Dunn is a contributing editor for PC World.



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# INTERNET TIPS

SCOTT SPANBAUER

## Build a Simple, Free Web Site on America Online

SNOBS MAY POOH-POOH the personal Web site as an egocentric vanity. But the World Wide Web wasn't invented just for people who are legends in their own minds. You can make a useful and interesting Web site filled with stories that may not be available elsewhere—information that perhaps only you possess. Remember those photos you took during your trip to Peru in the seventies? Suspect you're the world's greatest expert on Victorian coal scuttles? Offer the world what you know through the Web, and invite like-minded hopper-heads to add their say.

Whatever force drives you to the Web, you can get your manifesto—up to 12 megabytes' worth—online in minutes using America Online's free Hometown Web server at [hometown.aol.com](http://hometown.aol.com). Current AOL and CompuServe subscribers, AOL Instant Messenger and Netscape Instant Messenger users, and registered

### SHUT THAT BROWSER UP!

ONE DAY YOU suddenly notice that every time you click a link in Internet Explorer, it clicks—and that all the clicking is driving you crazy. You can make it stop. Open Windows' Control Panel, launch the *Sounds* applet (*Sounds and Audio Devices* in Windows XP), click the *Sounds* tab if it's not currently displayed, and then scroll down the 'Events' or 'Program events' list until you find the Windows Explorer section. Select the *Start Navigation* event at the end of the list, and then choose the (*None*) selection at the top of the *Sounds* drop-down menu. Netscape and Opera users, never mind: Your browser is blessedly silent.

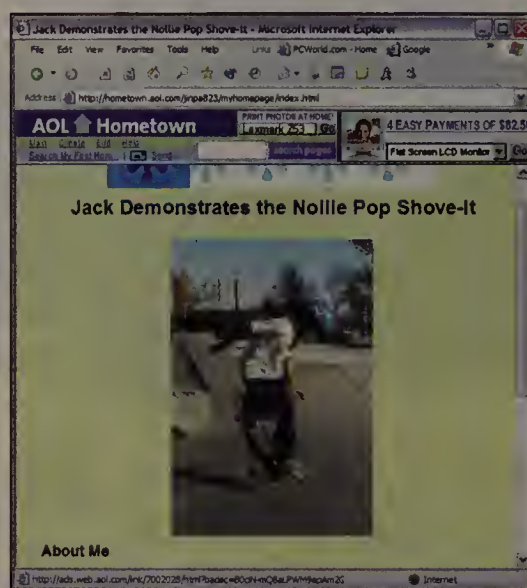


**FIGURE 1: WEAVE A QUICK, easy Web site in minutes, using AOL's Hometown Web server.**

Netscape.com Web site users are ready to go—all you need to get started are a screen name and a password. If you don't have an AOL screen name, you can get one by downloading and installing the free AOL Instant Messenger program (at [www.aim.com](http://www.aim.com) or [find.pcworld.com/26201](http://find.pcworld.com/26201)), or by creating a Netscape.com account for yourself at [my.netscape.com](http://my.netscape.com).

### 1-2-3, PUBLISH!

WHEN YOU'RE ready to crank out a quick Web site, cruise to [hometown.aol.com](http://hometown.aol.com) and click the *Create* link in the AOL Hometown banner at the top of the page. (The same banner appears at the top of any page you create on AOL Hometown—that's the price for your "free" Web site.) After signing in, you'll see a page listing several options for creating and editing your page. Click *Create* again to open 1-2-3 Publish, a free forms-based tool that builds a simple page with the title and text of your choice, a single photo

you upload from your computer, page-divider graphics, and autobiographical and link sections for you to fill in. 1-2-3 Publish also offers lots of prefab theme pages for cities, hobbies, and sports.

If cute templates make you shudder, you can skip all that and create a simple page with a picture, a title, and brief text by clearing the form fields you don't want (see **FIGURE 1**). Be sure to scroll to the end of the form and decide whether to include either of two AOL advertising banners at the bottom of your page; like other 1-2-3 Publish page elements, the banners are optional but enabled by default.

When you're done, a page preview button lets you see your work, and a *Save My Page* button publishes your page. Welcome to the Web! AOL will send you an e-mail message with your page's address, which should be [hometown.aol.com/screenname/myhomepage/index.html](http://hometown.aol.com/screenname/myhomepage/index.html), where *screenname* is the screen name you signed in with to create the page.

To make changes to your page using 1-2-3 Publish, simply browse to your site and click the *Edit* link at the top of the page. To see your changes, you'll probably have to click your browser's refresh button after editing.

If you want a more sophisticated Web site than the 1-2-3 Publish cookie cutter allows, you have two choices. AOL's Easy Designer ([hometown.aol.com/ed](http://hometown.aol.com/ed)) is an online Web design tool like 1-2-3 Publish but with slightly more features. Or you can use any third-party Web-page design tool (for instance, I still rely on Netscape's Composer) and then upload your finished pages and files to the Hometown server using a file transfer protocol utility.

Rhino Software's FTP Voyager ([www.ftpvoyager.com](http://www.ftpvoyager.com)) is a good shareware tool, but the command-line version in every version of Windows will also do the trick. For a useful tutorial on working with FTP commands, see the chapter on FTP in Indiana University's *Zen and the Art of the Internet* ([find.pcworld.com/27061](http://find.pcworld.com/27061)). ■

Send your questions and tips to [nettips@spanbauer.com](mailto:nettips@spanbauer.com). We pay \$50 for published items. Scott Spanbauer is a contributing editor for PC World.

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## STEP BY STEP

STAN MIASTKOWSKI

## Reclaim Hard-Drive Space

TODAY'S HARD DRIVES feature jaw-dropping amounts of space. But no matter how big your drive, you'll be amazed at how quickly application installs, browser

caches, and temporary files can eat up your free space and clutter your system. Some simple hard-drive cleaning measures can free up valuable disk space and

get rid of applications and data files that you no longer use or want.

A raft of commercial utilities can help clear disk space, but you don't need to lay down the bucks to get the job done. Windows has an array of built-in tools for doing a thorough drive cleaning. You can sweep away many megabytes—and sometimes even gigabytes—of unneeded files.

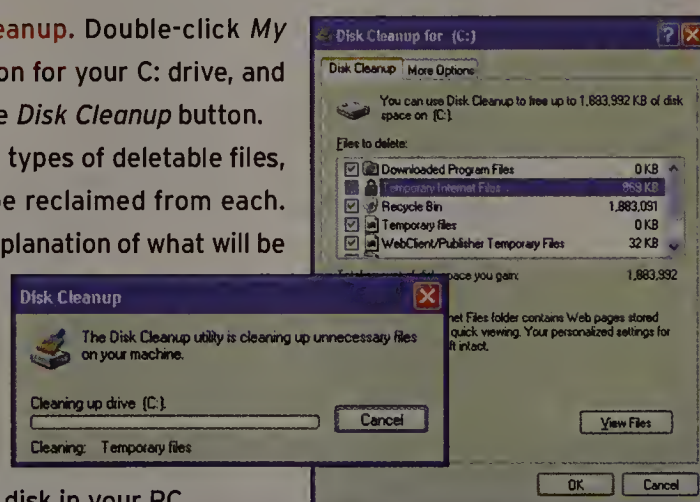
As always, before you begin, do a complete backup of your system. ■

Stan Miastkowski is a contributing editor at PC World. Address your questions to him at [stan\\_miastkowski@pcworld.com](mailto:stan_miastkowski@pcworld.com).

**1 Fire up Windows' Disk Cleanup.** Double-click *My Computer*, right-click the icon for your C: drive, and choose *Properties*. Then click the *Disk Cleanup* button.

Windows will show you a list of types of deletable files, along with the space that can be reclaimed from each. Highlight each category for an explanation of what will be swept away, and check the ones you want cleaned out. Then click *OK*. Windows will ask you to confirm your choice, and then it will delete the files for you.

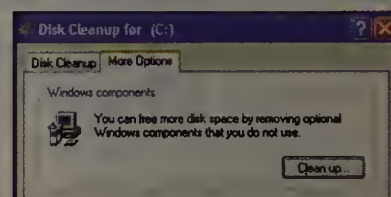
Repeat this step for each hard disk in your PC.



**2 Remove unneeded Windows components.** Follow the instructions in step 1 to get to the Disk Cleanup screen. Choose the *More Options* tab, and click the *Clean up* button under 'Windows components'.

You'll see a list of components you can uninstall. For example, if you don't play games, you can save 12MB by deleting them. Checked components are installed; to uninstall them, first click the check mark to clear it and then click *OK* on the Details dialog box and *Next* on the Windows Components Wizard. Then follow the on-screen

directions. You can reinstall components later.



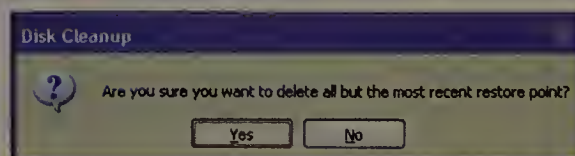
**3 Remove unused applications.** The longer you use Windows, the more likely you are to fill up your hard drive with applications that you rarely use. To see what you've installed, click *Clean up* in the 'Installed programs' section of the *More Options* tab.

In Windows 98 and Me, you'll go to the *Add/Remove Program Properties* screen. Highlight the program you want to delete, and click the *Add/Remove* button.

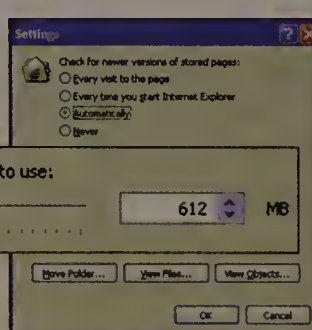


Windows XP gives you more information when you click each application, including how often you use it and how much space it occupies. To remove each application, choose it, click *Change*, and then follow the directions.

**4 Delete restore points.** In Windows Me and XP—though not in 98—the system stores settings you can use to “go back” if a system change causes problems. If you do a lot of installing and uninstalling, you'll have many restore points taking up space. To delete all but the most recent one, click *Clean up* under System Restore on the *More Options* tab.



**6 Adjust your browser cache.** Internet Explorer and other browsers cache Web pages you've accessed. To limit the size of this cache, right-click the *Internet Explorer* icon and choose *Properties*. On the *General* tab, click the *Settings* button under 'Temporary Internet files'. Decrease the 'Amount of disk space to use' value.



**5 Convert to FAT32.** If you upgraded an old Windows 95 system to 98 or Me, find any FAT drives and convert them to the more-efficient FAT32 system. Right-click each drive icon and pick *Properties* to list the file system.

To convert drives in Win 98, go to *Start Programs Accessories System Tools Drive Converter (FAT32)* and follow the directions.

Me users should boot from the Emergency Disk created when the OS was installed. To convert a drive, type CVT, press the spacebar, and type the drive letter followed by a colon (for example, CVT C:) at the A:> prompt.

**7 Finish up.** Make sure all of the deleted files are gone. Empty your Recycle Bin. Finally, defragment each of your hard drives. To do this, open *My Computer*, right-click the drive icon, and choose *Properties*. Choose the *Tools* tab, and click *Defragment Now*.

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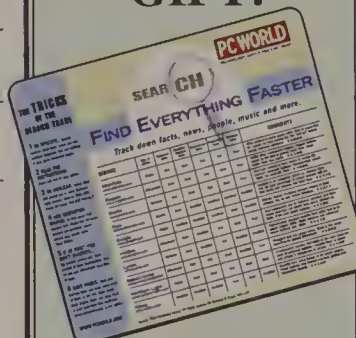
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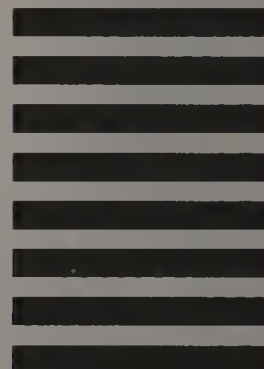
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# HARDWARE TIPS

KIRK STEERS

**FORMAT DILEMMA:  
NTFS OR FAT32?**
**FIND THE RIGHT  
LCD RESOLUTION**
**USB 2.0/FIREWIRE  
ON ONE ADAPTER**

## Give Your Ears a Break: Put Your PC on the QT

IS YOUR PC noisier than Bourbon Street on a Saturday night? Most computers can produce enough clicks, whirs, and rattles to make even the most focused person reach for the earplugs. Silencing your system isn't easy, but if you're willing to do a little work—and spend a little money—you can probably shush your computer.

### TURN DOWN THE VOLUME

STOPPING PC RACKET at the source can be difficult because the two primary noisemakers are your PC's fans and hard drive(s)—vital components that must remain on while you work. But you can do a few things to keep them quiet.

**Tighten Up:** All it takes is a loose screw or an ill-fitting case to turn a quietly running component into a rattletrap. Check inside the case to make sure all the expansion cards, drives, and cables are securely fastened. And be sure to fit the case snugly

back on when you're finished. Unfortunately, some poorly designed cases make noise even when they're properly fastened. If that's the case with your case (sorry about that), you may be able to make it quieter by using a vibration dampening kit such as Dynamat's Xtreme Computer Kit (\$30). Find out more at [www.dynamat.com](http://www.dynamat.com).

If your PC sits on a desk-top, tiled floor, or other hard surface, you can reduce the level of vibration by placing a rubber mat under the PC. Computer stores sell anti-vibration mats; alternatively, you can save some money and reduce landfill by rounding up several old mouse pads instead.

**Fans:** The only way to silence your PC's fan entirely is to buy a PC that doesn't need one. KryoTech produces an AMD-based system that's actually refrigerated. (No, it doesn't have a place to store your lunch.) For people who build their own systems, Koolance sells a water-cooled case. One warning, though: Both companies' products are expensive. Check them out for yourself at [www.kryotech.com](http://www.kryotech.com) and [www.koolance.com](http://www.koolance.com), respectively.

If you're more budget-minded, you may prefer to replace your PC fan with a quieter model. To hush your power-supply fan, you need to buy a complete power supply unit—and they're not cheap, either. PC Power and Cooling ([www.pcpowercooling.com](http://www.pcpowercooling.com)) sells the 235-watt Ultra-Quiet Silenc-

er 235 ATX for \$59. If a noisy power supply is driving you nuts, however, the product may be a bargain. For low-cost cooling fans that are built into your PC's case but separate from the power supply, check out PC Power and Cooling's \$9 Silencer Auxiliary Cooling Fan. Two sizes are available, so make sure to get the one that's better for your PC's case.

Many systems use a fan to cool the CPU. Others use a passive heat sink—a metal (usually aluminum) cover studded with many fins or spikes to dissipate heat silently (there are also active heat sinks—that is, heat sinks with fans). Third-party heat-sink vendors may tout their products' noiselessness, but before you replace a noisy CPU fan with a silent heat sink, make sure that the sink will cool enough to keep your CPU from frying.

**Hard drives:** Any device that spins at 7200

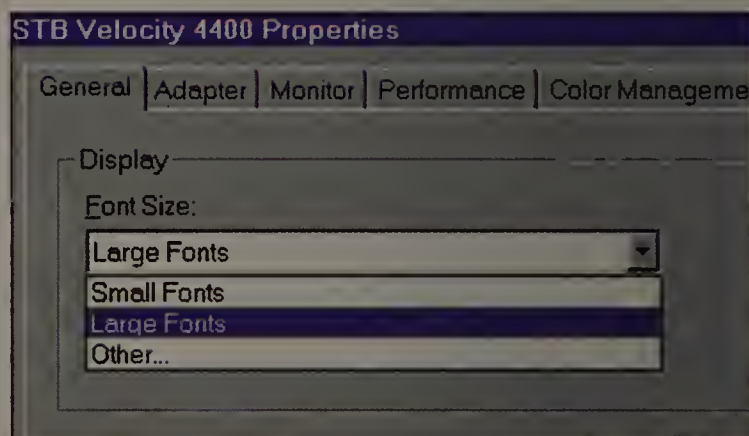


**FIGURE 1: FONTS TOO SMALL** on your new LCD? To keep your high-resolution setting, tell Windows to use a larger font.

rotations per minute is bound to make some noise. (A car with wheels spinning that fast would be moving at over 500 mph!) Your best bet for quieting a loud hard drive is to use a sound insulator. Molex's SilentDrive is a plastic case that encloses your hard drive in a drive bay and muffles much of the sound it emits. The SilentDrive is available in the United States from New England Digital ([www.nedcomp.com](http://www.nedcomp.com)). Hard drives can generate a lot of noise when they read and write data. To minimize the annoying clicks of an active hard disk, run Disk Defragmenter regularly. In most versions of Windows, click *Start•Programs•Accessories•System Tools•Disk Defragmenter*. Defragmenting your disk makes the task of accessing files faster and more efficient.

### BUYER BE WARY

BUYING A PC isn't always easy. If you're trying to save a few bucks by purchasing a generic computer from an unfamiliar seller, you should make sure that you get the processor you pay for. Intel's Processor Frequency ID Utility identifies the CPU in any Intel-based system and tells you whether it's been overclocked. Two versions are available: One works with any version of Windows; the other runs from a bootable floppy, which allows it to work on any PC. Go to [find.pcworld.com/25181](http://find.pcworld.com/25181) to download your copy.

A hard drive that chirps incessantly—even when you're not writing to or reading from it—may indicate that your system needs more RAM. When your PC's physical RAM fills with data, Windows starts writing the overflow to a swap file on the hard drive. Having too little RAM increases the number of hard-drive accesses—and the level of noise. For more information on improving your PC's performance by setting the size of your swap file manually, see last month's *Answer Line* ([find.pcworld.com/26181](http://find.pcworld.com/26181)).

Also, if you're thinking of buying a new hard drive, consider the Barracuda series from Seagate; these drives have the reputation of being easy on the ears.

## LOCATION, LOCATION, LOCATION

EVEN IF YOU can't stop your PC from making a racket, you can keep some of the noise from reaching your ears. Stuffing your PC into a nearby closet or drawer would be ideal, but the monitor cable and removable media make this problematic. You can probably move your PC off your desktop and into a quieter spot under your desk, however.

It may not look very nice, but a simple housing for your PC that you construct out of plywood, particle board, or even cardboard can function as an effective muffler. Make sure the housing is big enough to allow adequate circulation of air around your PC's case. Another way to reduce the noise level around your PC is to line all reflective surfaces near the machine with sound-absorbent materials such as carpet samples or egg cartons.

## TIME TO LOSE SOME FAT?

**?** WHILE UPGRADING my operating system from Windows 98 to Windows XP, I was asked if I wanted to convert my hard disk's file system to NTFS from the current FAT32. Being a firm believer in "If it ain't broke, don't fix it," I chose to stick with FAT32. Was this a mistake?

*Peter Nyberg, Charlotte, North Carolina*  
NOT NECESSARILY. If you plan to use multiple operating systems on your PC, stay with FAT32. Windows 98 can't read files stored on a partition using NTFS. In

addition, unlike NTFS, FAT32 allows you to boot from a DOS floppy to perform emergency recovery tasks on the hard disk.

On the other hand, NTFS has some advantages—including encryption and data recovery—over the FAT and FAT32 file systems used by Windows 9x. And if you have a hard drive larger than 32GB, NTFS allows you to use it as a single partition, whereas FAT32 will not.

It's not too late to convert your hard disk from FAT32 to NTFS. Just type **convert.exe c: /fs:ntfs** at the command prompt. You can also change your Windows file system by using a third-party utility such as PowerQuest's Partition-Magic 7 (\$70). Go to [find.pcworld.com/26182](http://find.pcworld.com/26182) to download the trial version.

## NATIVE UNREST

**?** I JUST BOUGHT a 15-inch LCD. When I set the resolution to 800 by 600 dpi, which is what I had been using on my 17-inch CRT, I was surprised to find that the screen image looked terrible. Changing the resolution to 1024 by 768 sharpened the image, but now text is uncomfortably small. Is there any way for me to improve my image, or am I stuck?

*John Abbott, Hartford, Connecticut*  
AN LCD WORKS BEST at a specific screen resolution, usually called its native resolution. Resolutions higher or lower than the native setting usually produce fuzzy text and lower-quality images. A 15-inch LCD such as yours commonly has a native resolution of 1024 by 768, and that's the resolution you want to use. You still have a few options, however.

First, bump up the size of your Windows fonts. In Windows 98, 2000, or Me, right-click the desktop and choose *Properties•Settings•Advanced* (see **FIGURE 1**). In Windows XP, right-click the desktop and select *Properties•Appearance*. If you can, change the size of fonts in your individual applications, too. For more on Windows fonts, consult the August 2001 column of *Windows Tips* ([find.pcworld.com/25202](http://find.pcworld.com/25202)).

If your LCD is attached to an analog graphics card, you may be able to improve



**FIGURE 2: TWO IN ONE! A USB 2.0/IEEE 1394 combo card takes up just one PCI slot.**

image quality by reducing the refresh rate (the number of times per second your graphics card draws a complete image on an analog monitor). A refresh rate above 75 Hz produces a flicker-free image. Not all LCDs work the same way, however. A higher refresh rate can actually hinder conversion of your PC's analog signal to your LCD's native digital format. Try lowering the refresh rate to 60 Hz. Right-click the desktop and choose *Settings•Advanced•Adapter*. In Windows XP, select the *Monitor* tab. Of course, if you happen to have a graphics card with digital output, you bypass this problem altogether.

## A DOUBLE-DECKER PC BUS

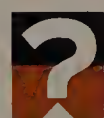
**?** I WANT TO ADD a USB 2.0 port to my PC for a CD-RW drive and an IEEE 1394 (FireWire) port for my digital video camera. I have only one PCI expansion slot left open in my PC. I'm strongly considering buying a new PC with USB 2.0 built in. Is there a cheaper alternative?

*Alvin Kremer, Spokane*  
ABSOLUTELY. Several combination cards on the market provide both USB 2.0 and IEEE 1394 ports on a single expansion card, and each of them uses just a single PCI slot. And by the time you read this, the FireWire/Hi-Speed USB 2.0 PCI Card from Belkin should be available, at a price of around \$120 (see **FIGURE 2**). ■

*Send your hardware-related questions and tips to [kirk\\_steers@pcworld.com](mailto:kirk_steers@pcworld.com). We pay \$50 for published items. Kirk Steers is a PC World contributing editor.*

## ANSWER LINE

LINCOLN SPECTOR

CUSTOMIZE YOUR  
'SEND TO' MENUONE CLICK CLOSES  
ALL OPEN APPSNEW PC, SAME OLD  
OUTLOOK SETTINGSCreate a Start-Up Floppy  
for Windows 2000 and XP

WINDOWS XP lacks the start-up disk feature of earlier Windows versions. How do I create a bootable floppy I can use if XP fails to boot?

Brian Kramp, Provo, Utah

WINDOWS 9x and Me let you create a floppy disk you can use to start your system in case anything goes wrong with your hard drive. The start-up disk boots your PC into MS-DOS and contains various diagnostic and repair tools.

Windows 2000 and XP take a different approach to booting in PC emergencies than 9x and Me do. Some of their solutions don't even require a floppy. For instance, if Windows 2000 or XP hangs while loading, simply reboot and press <F8> as your PC begins to reload the operating system to see a menu of boot options (you may have to press <F8> twice to

get the full menu). Your best option for restoring your PC is probably to select *Last Known Good Configuration*. If this choice doesn't work, try selecting *Safe Mode*. Keep in mind that your mouse won't work on this menu; you must use your keyboard's arrow keys.

Such nonfloppy restoration methods rely on Windows itself, however. If Windows won't even start to boot, you'll need a boot disk. Here's how to make one:

Start with a blank, formatted floppy disk. It may seem counterintuitive, but this disk shouldn't be bootable. If you need to format a floppy, simply insert the disk into its drive, double-click *My Computer*, right-click the floppy drive icon, select *Format*, and then click *Start*.

Next, open your C: drive in Windows Explorer. If Explorer displays a warning, click *Show the contents of this folder*. To display the particular files you need, select *Tools•Folder Options*, then click the *View* tab. Make sure *Show hidden files and folders* is selected, and uncheck *Hide protected operating system files (Recommended)*. At the warning, click *Yes*, then *OK*.

Copy the files *boot.ini*, *ntdetect.com*, and *ntldr* to your floppy. Remove the disk, open the write-protect switch in its bottom-left corner, and label the floppy "Boot Disk." Return to the *Folder Options* dialog box and recheck *Hide protected operating system files and folders (Recommended)*.

Place this floppy in the drive and reboot your system. Your PC will bypass the

basic boot files on your hard drive, but it will otherwise load Windows normally.

## ADD TO THE 'SEND TO' MENU



IS THERE A WAY I can add programs to the Send To list that I get when I right-click a file?

Daniel Wissinger, Ruffsdales, Pennsylvania

THE SEND TO MENU is simply a folder. Put a shortcut in the folder, and it will be on the menu. You can right-drag a file or folder to the Send To folder and select *Create Shortcut(s) Here* to put a shortcut to that item on the menu, too (see **FIGURE 1**).

So where is the Send To folder? In Windows 9x and Me, the folder path is C:\Windows\SendTo. In Windows 2000 and XP, the path is C:\Documents and Settings\username\SendTo, where *username* is your user name for the computer.

In Windows 2000, Me, and XP, Send To

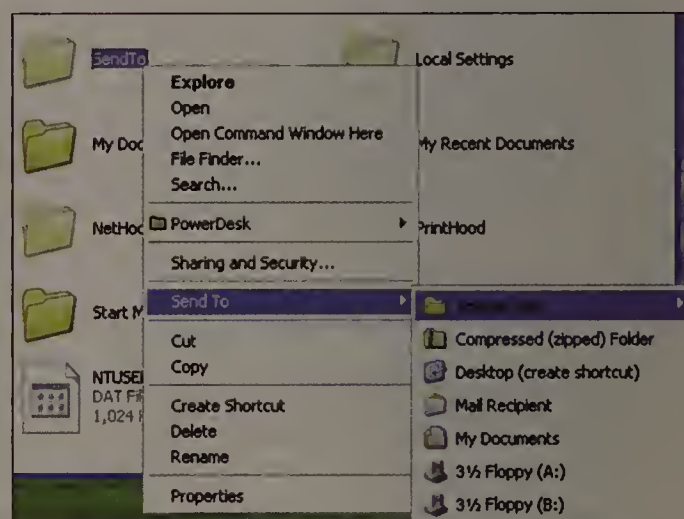
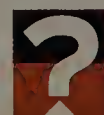


**FIGURE 1: THE SEND TO MENU** is a folder holding shortcuts. The hard part is finding the folder.

is a hidden folder. To view hidden folders, open Windows Explorer, select *Tools•Folder Options*, click the *View* tab, select *Show hidden files and folders*, and click *OK*.

CLOSE ALL PROGRAMS  
WITH ONE CLICK

HOW CAN I easily close all Windows programs before installing a new application or running ScanDisk?

Ted Earley, Goleta, California

WE'RE OFTEN TOLD to close all open programs before performing some action—installing a new program or defragmenting a hard drive, for example.

But which programs do you need to close? Some experts say you have to close

## TIME-STAMPING IN EXCEL

IT'S EASY TO DATE or time-stamp a Microsoft Excel worksheet. To insert the date, press <Ctrl>-<:>. For the time, press <Ctrl>-<Shift>-<:>. To stamp the time and date, press <Ctrl>-<:~>, the spacebar, and then <Ctrl>-<Shift>-<:~>. To turn these keystrokes into a macro, select *Tools•Macro•Record New Macro*, give the macro a name, assign it a shortcut key combination, and press *OK*. Insert the date and time as described above, and then press the recorder bar's stop icon. To add dates and times that update automatically, append the *=today()* and *=now()* functions to your macro.

only the applications that run in their own windows and that minimize to the main section of the taskbar. Others recommend that you close everything except Windows' bare bones, including antivirus software, firewalls, and other programs that run in the background. I close just the applications, and it has never caused a problem.

The easiest way to close all programs is with BK-Soft's Kill Win freeware or its \$15 shareware cousin, Kill Win Pro (both are available at [find.pcworld.com/12286](http://find.pcworld.com/12286)).

To create a shortcut that will close only your applications, right-click the *Kill Win* icon in your Start menu and select *Copy*. Then right-click the desktop and select *Paste*. Right-click the new icon on your desktop and select *Properties*. Choose the *Shortcut* tab; in the Target field, add a space and then */w* to the end of the existing text, so that it reads something like 'C:\KillWin\KillWin.exe /w'. Click OK, then right-click the icon to rename the file **Close applications**. If you wish, you can drag the icon back to the Start menu.

Kill Win has an option to close everything, but it's not very good. It just reloads Windows, skipping your autolaunching programs; it doesn't work at all in XP. If you want to use it, follow the instructions above for creating a close-all-apps icon, but instead of adding */w*, add */p*. Name the shortcut **Close everything**.

## ARCHIVE AN OE MAILBOX

**?** OUTLOOK EXPRESS stores each e-mail folder as a .dbx file. If I archive one of these files to a floppy, then delete the folder, how do I restore it?

*Peter R. Law, Monroe, New York*

OUTLOOK EXPRESS keeps saved e-mail in .dbx files in a location called *Store Folder*. To find your Store Folder, open OE, select *Tools•Options*, click the *Maintenance* tab, then the *Store Folder* button. (The word *folder* gets a little confusing here, since an Outlook Express "folder" is a Windows file that resides in a Windows "folder.")

To archive an Outlook Express folder, go to your Store Folder and move the .dbx file to a floppy, CD-R, or other removable medium. Then delete the folder in Outlook Express if you no longer want it.

To restore your saved e-mail, open Outlook Express and select *File•New•Folder*. Give the new folder the same name as the one you're restoring (it's the archived file's name, minus the .dbx extension), and press **<Enter>**. Click the new, empty folder and close Outlook Express. Now copy the archived .dbx file to your Store Folder. If you named the new folder properly, Windows will ask you to confirm that you want to replace the file; click *Yes*.

The next time you reenter Outlook Express, your saved e-mail file will be there.

## MIGRATE OUTLOOK TO A NEW COMPUTER

**?** IN JANUARY, you told us how to transfer Outlook Express settings ("Move Outlook Express Settings to a New PC," [find.pcworld.com/27161](http://find.pcworld.com/27161)), but what about Microsoft Outlook settings?

*James Hoffer, Smithsburg, Maryland*

MIGRATING OUTLOOK is easier than migrating Outlook Express. You need to export only accounts, rules, and folders. Accounts identify you on the Internet, and rules determine how you filter incoming e-mail, among other vital functions. Important Outlook data—such as your address book, your saved e-mail messages, and any calendar appointments—are in folders.

To migrate accounts, open Outlook on the old PC, select *Tools•Accounts*, choose your mail account, and then click *Export*. Save the file to a shared folder or to a removable medium, and then click *Close*.

To export your rules, select *Tools•Rules Wizard*, click the *Options* button, then *Export Rules*. Again, save this file to a shared folder or removable medium.

To export folders, select *File•Import and Export* on the old machine, and on the first page of the Import and Export Wizard, select *Export to a file* (see **FIGURE 2**). On the next page, select *Personal Folder File (.pst)*. On the page after that, select *Personal Folders*, check *Include subfolders*, and click *Next*. Save the file to a shared folder or a removable medium as well.

When you move these three files to the new computer, repeat the above steps in

Outlook on that machine, choosing to import rather than to export. If you get the Startup Wizard when you start Outlook on the new PC, click *Cancel*, then *Yes*.

The obvious way to import your accounts is to select *Tools•Accounts*, click the *Import* button, and import the file from the old computer. If you're using Office 2000, this will work. Unfortunately, you can't directly import an account in Office XP's Outlook 2002. To do so indirectly, launch Outlook Express and select *Tools•Accounts*. Click the *Import* button and import the account file that you copied from the old computer to your shared folder or removable medium. Click *Close*, then close Outlook Express. Back in Outlook, select *File•Import and Export*; then choose *Import Internet Mail Account Settings* and follow the prompts.

To import your rules, select *Tools•Rules Wizard*, click the *Options* button, then the *Import Rules* button. Now simply import the file from the old computer.

Importing folders works as it should in

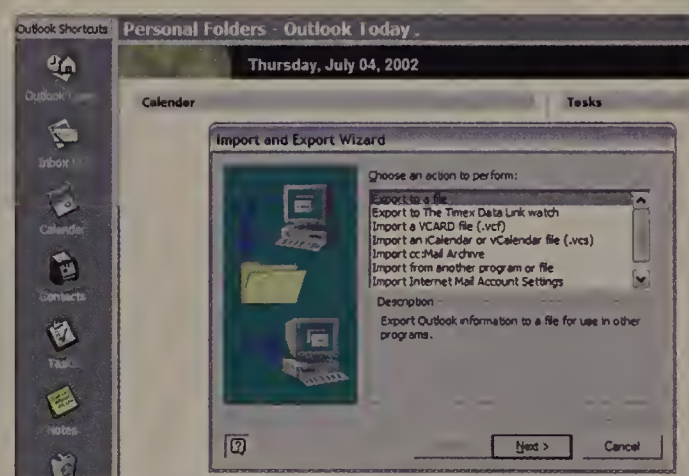


**FIGURE 2: TO MIGRATE OUTLOOK to a new PC, you must export and import program files.**

both Outlook versions. Select *File•Import and Export*. Choose *Import from another program or file*, then *Next*. Click *Personal Folder File (.pst)* and *Next* again. Import the folders file you copied from the old computer to a shared folder or a removable medium. If some of your old folders don't appear on the Outlook Bar, select *View•Folder List* and drag them to it. ■

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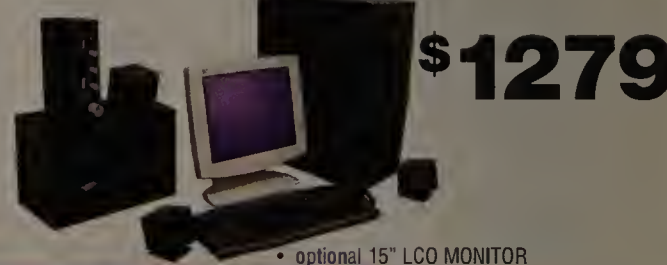
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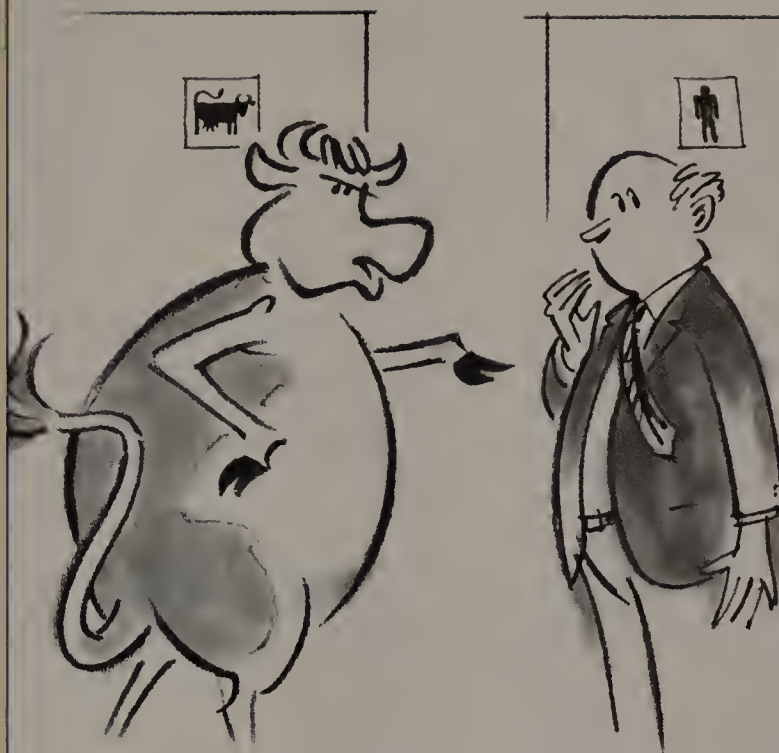
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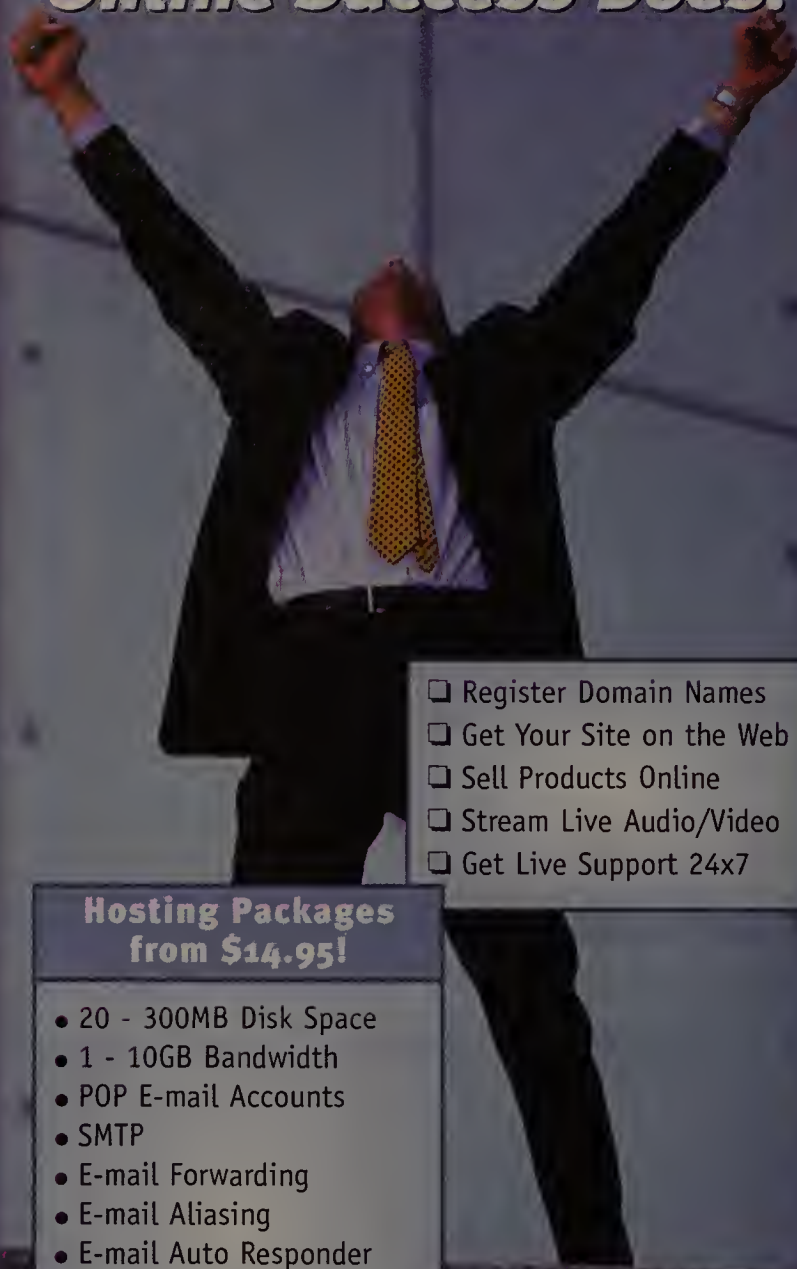
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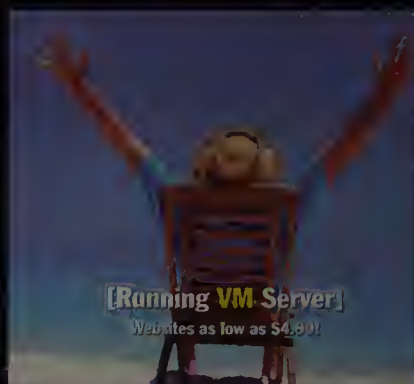
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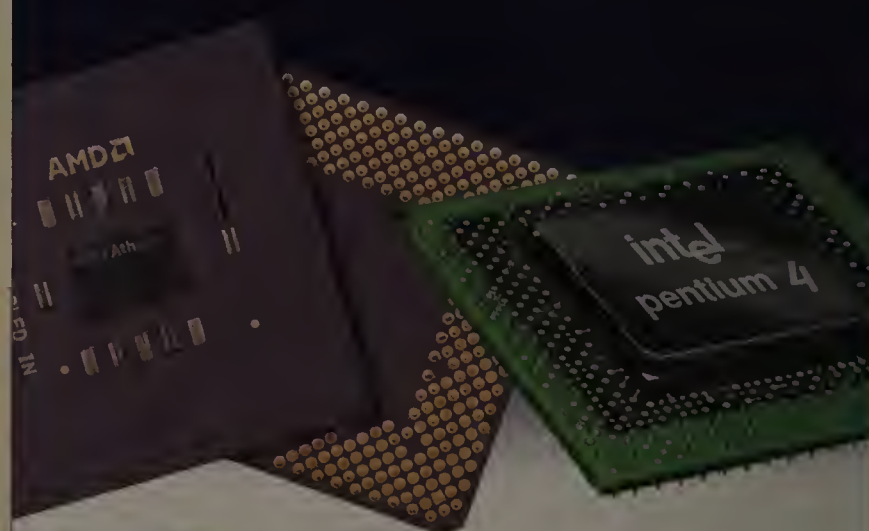
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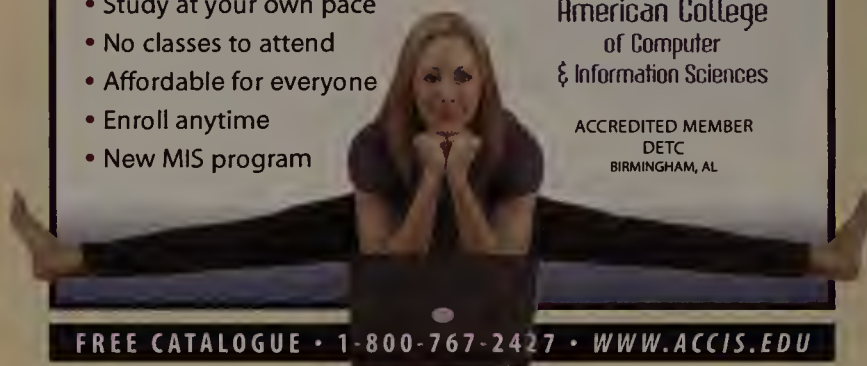
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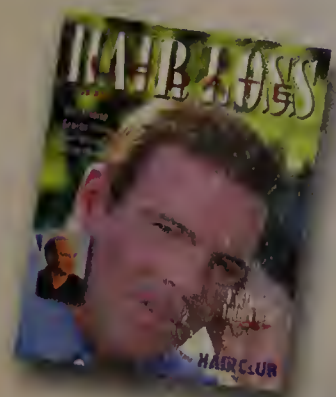
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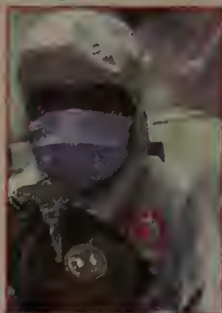
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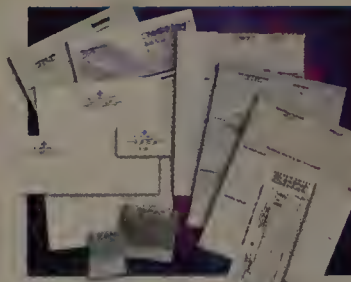
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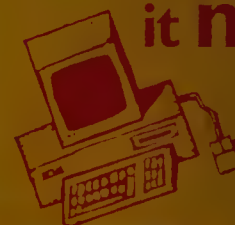
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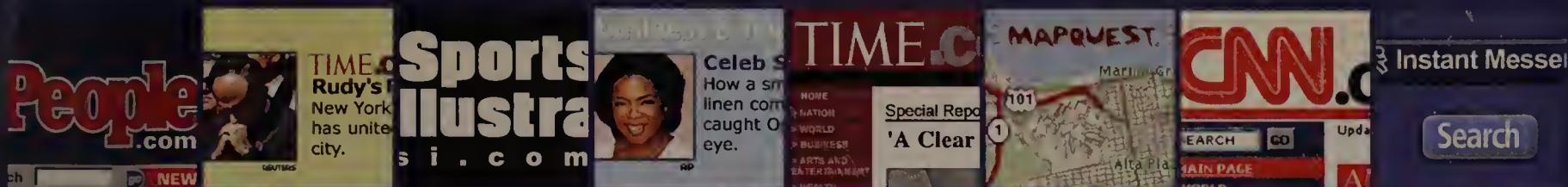
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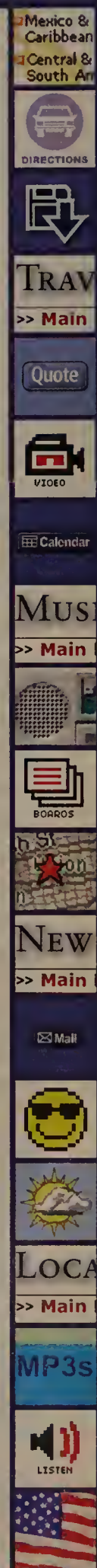
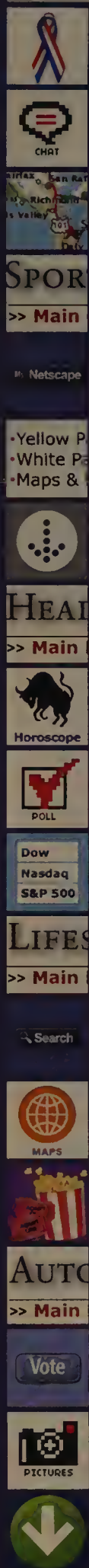
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## Networking: You Still Need a Geek

METCALFE'S LAW, propounded long ago by the inventor of the Ethernet protocol, states that the usefulness of a network is equal to the square of the number of users. Manes's corollary, propounded a minute ago by the inventor of this column, states that the usefulness of a network equals zero if you can't get the net to work at all.

Big networks work pretty darn well because, when they don't, jillions of professional computer geeks rush in to attack the problems. But the little networks that you or I set up are another story. And though new technologies let us get connected without yanking wires through the walls, those of us who regularly put home and office networks together and pull them apart know one rule from bitter experience: Assume nothing.

Just because two PCs can ping each other via Internet protocols doesn't mean they'll be able to see each other in Windows. Just because machine X can see machine Y doesn't mean machine Y can see machine X. Just because a computer's name appears in Network Neighborhood doesn't mean it's even turned on.

Say you invoke a networked printer, and it's turned off or out of paper. Do you receive an error message that tells you what's going on, or does your print job vanish into the ether? Will the "Wake-on-LAN" network card rouse a remote PC, or will you have to

hike over and tickle its keyboard? The inconsistent answers to questions like these are guaranteed to drive you nuts.

There's plenty of blame to go around. Some of it rests with broadband ISPs whose employees lack the tools to understand even something as simple as whether a problem lies within your walls or outside them. Result: Clueless techs parrot standard scripts at equally clueless users who just want the network to work.

With Windows XP, Microsoft has made

**Maybe networks  
should come bundled  
with a phalanx  
of experts.**

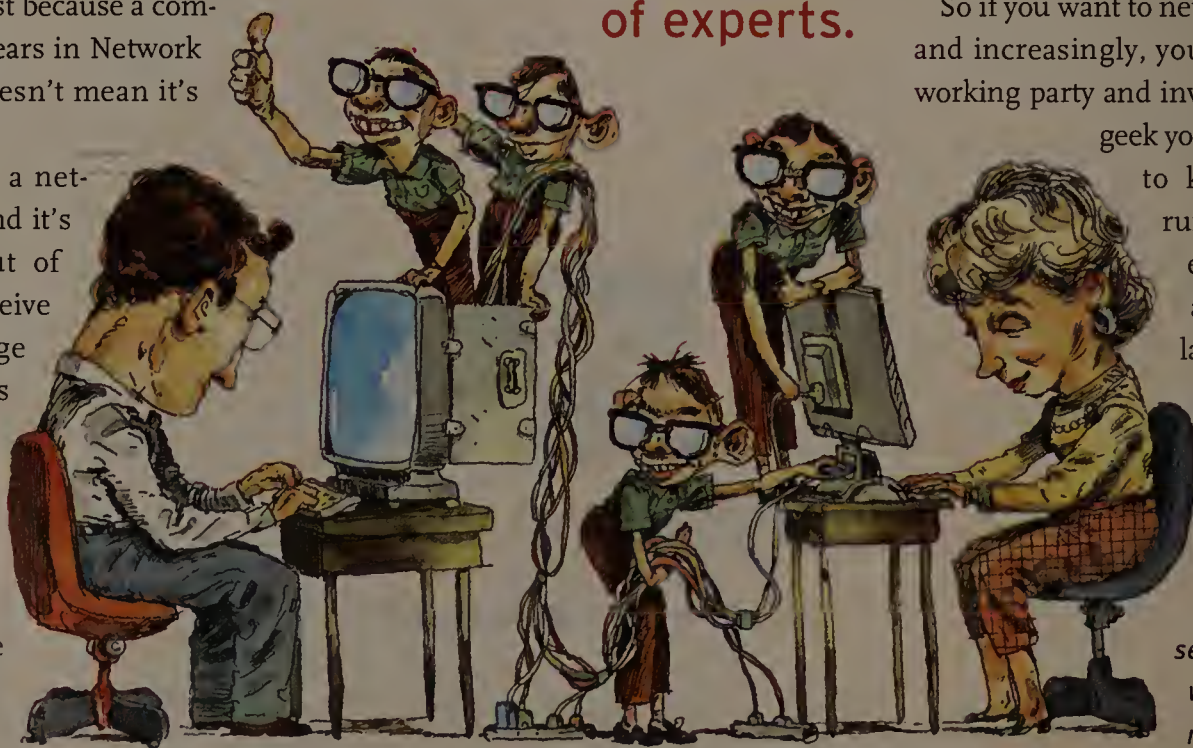
its first reasonable try at getting networking right—but too often, the job is still too hard. Just try to read the help screens on Network Bridges without screaming.

And the screams get louder when you grapple with networking nomenclature. Can you tell when you need a straight-through cable and when you need a crossover? (Hint: If the light on the networking device's connector doesn't go on, you need the other kind.) Do you know what a four-day DHCP lease is and how long it lasts? (Hint: It's not four days.)

If you aced that quiz, get ready for the joy of wirelessness. How come *ESSID* and *SSID* mean the same thing, but the *SSID* number differs from the same device's channel number? What's the difference between an "ad hoc" network and an "infrastructure" one? If you don't know, expect to get the network working only if you're the sort of person who wins the lottery twice a week.

So if you want to network your home—and increasingly, you do—throw a networking party and invite every computer geek you know. If you want to keep the network running, wait till the end of the evening and then kidnap the last geek still hanging around. ■

*Contributing Editor Stephen Manes, a cohort of the public television series Digital Duo, has written about PCs for nearly two decades.*



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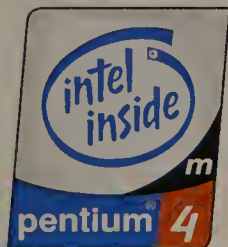


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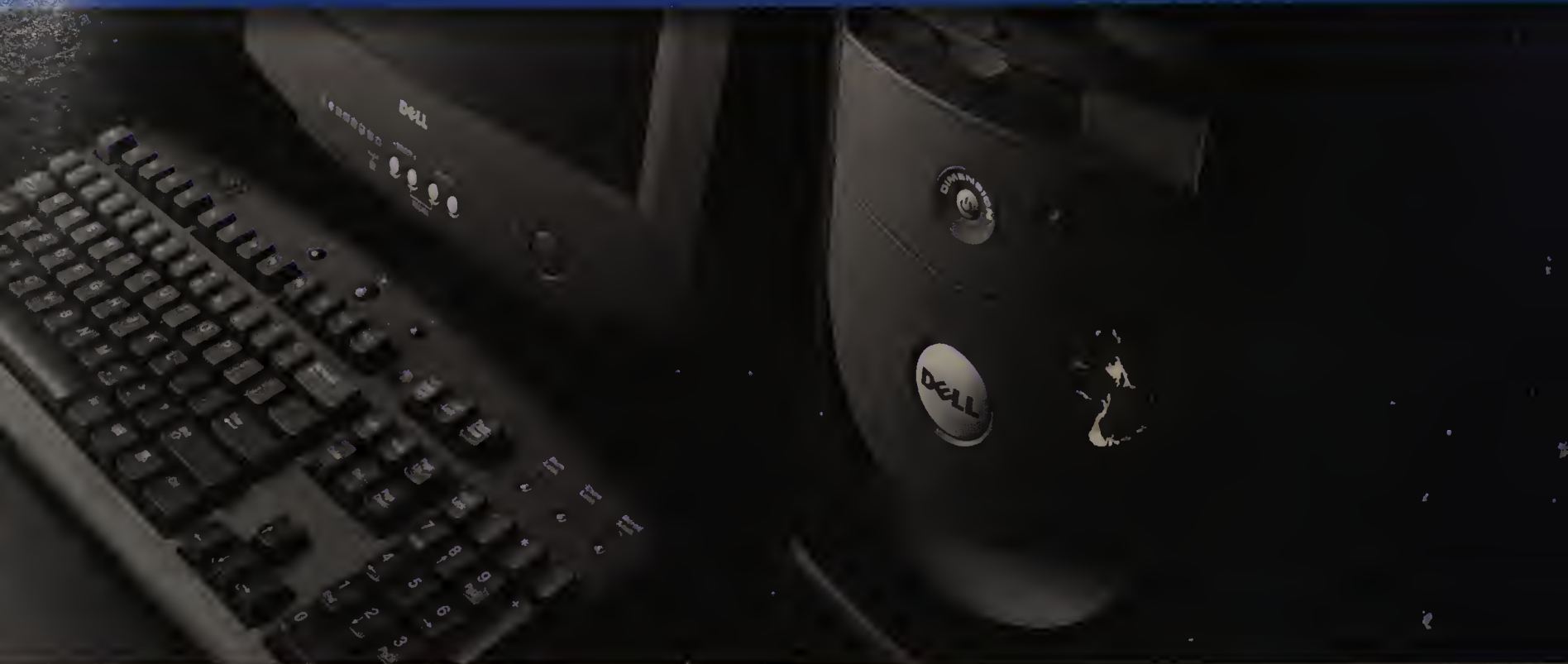
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